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ABSTRACT

One purpose of this paper is to suggest appropriate policy options for investment in education. While the discussion of issues and options is based on the research literature, field observations, and interviews, this is not a review of the state of the art. It is an attempt to define and focus the debate on investment choices. Section 1 of the paper reviews a systems approach to learning, related theories, and data. Section 2 explores the range of features of education systems (objectives, investment, internal efficiency, benefits and return on investment, employment, income distribution, and other features). Section 3 discusses the major issues in formal education (the resource constraint, ineffectiveness, inefficiency, inequality, and reform). Section 4 treats approaches to educational reform and strategy options. There are two phases in changes--awareness and transition (the nature of the demand of skilled manpower, the over/under supply of skilled manpower, the effect of past educational investment on social equity, and the resources required for transitions) and reorganization of learning (motivation for reform, information for reform, technological and legal changes, and resources for reform). (Author/IRT)

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

Bank Staff Working Paper No. 188

February 1974

Education, Poverty, and Development

This paper reviews the major features of educational systems in developing countries, and then outlines the major issues that relate to improving the effectiveness, efficiency and social equity of the systems. Options for national strategies are discussed.

EA 008 892

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SUMMARY

The expansion of investment in formal education has been phenomenal in the last two decades. And only in a few developing countries are there signs that the rate of expansion may be slowing down. In country after country, education has been the only sector to meet or exceed the planned investment targets. Demand has been fueled by critical manpower needs, parental pressures for more years of schooling for their children and thus better job opportunities, and the conviction that education is a human right for all citizens. Because of the relatively low capital costs, including foreign exchange, of supplying new school places, at least compared to creating new jobs, the supply rapidly expanded.

The successful expansion of formal education, however, has created a new generation of social and economic problems. Education has become the largest item in many countries' current budgets: as a result, unless present trends are damped, an increasing number of nations face serious financial problems. Foreign exchange costs become serious when the expansion of secondary and higher education forces the maintenance of ever larger numbers of expatriate teachers and imported school equipment and supplies. Yet reducing the rate of expansion creates serious political problems. Middle-class parents are the most outspoken when reductions are threatened, since their children, expecting a place at the secondary or university level, might not be admitted. And these parents are usually the main source of political support of the governments. Teachers, usually the largest single group of wage earners in a poor country, are also a politically potent element when changes in the education system are proposed.

Finally, recent research suggests that schooling has not been as effective in promoting cognitive achievement, as measured by school tests, as we had expected. Research results for Europe and the United States in the 1960's have recently been supported by results for a limited number of developing countries.1/ Non-school factors like parental behavior, nutrition, and peer group experience are more important than expected in predicting achievement scores. Traditional school inputs like class size, length of teacher training and expenditure per pupil, are usually insignificant in determining differences in student scores. This research has important implications for future investment decisions.

Policy makers in countries that are considering increased efforts at reducing poverty through employment, income redistribution and welfare measures, are asking what *is* the contribution of education to individual and social welfare? Should resources now used for formal education be shifted to the other programs where they might have a higher marginal social product? Can allocation within the sector be made more efficient and effective?

1/ John Simmons, "The Effectiveness of Schooling in Promoting Learning: A Review of the Research," (Washington, D.C.: IBRD, 1974).

While individuals in each country will have to undertake a thorough evaluation of their educational objectives and resources and promote broad consultation in preparing their strategy, three major areas for action appear significant.

A. To damp the social demand:

(1) Ensure that artificial wage differentials for different occupations be rapidly narrowed. International trade in human capital also requires better controls to limit the export of highly-skilled manpower from poor countries. Artificial distortions in factor and product prices should be reduced to encourage use of labor intensive technologies;

(2) Ensure that certificates of schooling are no longer required for most occupations. When employers become more skill specific in their needs, a flexible education structure will emerge to meet the better specified demand;

(3) Require that middle- and upper-income students share a greater burden of the costs of their secondary and higher education. Explore the advantages of establishing an educational bank to transfer to the consumer the responsibility for both repayment and purchase of educational services. Time spent in public service would count as a form repayment, and should be encouraged. Localize school taxation and expenditure so that the costs and benefits are better understood locally. Low-income groups should have sufficient subsidies to permit them to overcome the private costs of schooling; and

(4) In countries with an over supply of school leavers, introduce a system of quotas whereby the absolute number of students in the formal system at the secondary and higher levels is restricted to the rate of population increase or even less. It can be combined with existing exam systems. In some countries, rationing is already taking place on a basis of geographic location, which serves as a proxy for parental social status. It should be made explicit and fair. Finally, this should encourage the share of the national budgets and GNP going for schooling to fall for many countries and level off for others. Misallocation will be reduced.

B. Increasing the economic relevance of learning alternatives is more difficult than it may seem. Some countries like Cuba and China have made more sustained and comprehensive efforts than others. Rich countries have also made considerable efforts to improve learning among low-income groups. Some countries are considering nonformal education as a panacea for the illnesses supposedly caused by formal education, but we know virtually nothing about either how effective of how costly this is. To improve the opportunity for the development of alternative learning systems:

(1) Eliminate the monopoly power of governments in the field of organized learning. If creative and economic alternatives to formal schooling are to develop, then incentives should be established to encourage more productive learning technologies. Experience is increasing with voucher systems where the parents pay the teachers. Apprentice systems may be the most efficient for other skills;

(2) Increase the effectiveness with which the basic cognitive skills are learned, and thus reduce the phenomenon of primary schools producing semiliterates; and

(3) Explore the opportunities of informal education, using adults and more advanced students to teach.

C. Compensate for the inequality effects of most of the existing formal school systems:

(1) Establish quotas on the basis of social class, geographic location or school, to assure that the proportion of the low income students at secondary and higher levels is equal to or higher than their representation in the population;

(2) Consider the use of automatic promotion from one grade to the next;

(3) De-emphasize the role of examinations for promotion. Eliminate the social class bias to present examinations. Add the testing for wider range of behavioral skills; and

(4) Develop mechanisms to encourage students who dropped out to re-enter the formal system at an older age.

These suggestions are a best guess as to possible guidelines. They are nothing more than a starting point for discussion among the producers and consumers of formal education to improve efficiency and equity.

To increase the value of human capital with optimal use of resources will require significantly different approaches than are now being used in most poor countries. The evidence increasingly shows that the early factors which determine cognitive and noncognitive traits need increased understanding and investment. The traits required by occupation as well as leisure need to be more systematically considered than they have in the past. The question 'learning for what' is essential for both individuals and societies. What is called for is an integrated strategy for investment in human capital that considers the potential contribution of all human capital inputs. Such a strategy would assist in reduing past inefficiencies and inequities and increasing the returns to scarce resources.

EDUCATION, POVERTY, AND DEVELOPMENT

John Simmons*

> The poor are not educated to see their interests, and they are not organized to fight for their interests. - Gunnar Myrdal

To what extent does investment in formal education contribute to economic growth and development? What are the relationships among education, employment and income distribution? What percentage of a developing country's GDP should be spent on education? To what extent can formal education educate the poor to see their interests and to fight for them. These are some of the questions that arise when investment in education is discussed. Our review of these and related questions will suggest that there are more questions than answers. But even given this uncertainty, the main thrust of this paper is to suggest that we have sufficient evidence to indicate that educational investment in developing countries requires major redirection. If investment in learning is to increase its contribution to development, then we first need to change the way we have thought about it in the past.

One purpose of the paper is to suggest appropriate policy options for investment in education. While the discussion of issues and options is based on the research literature, field observations and interviews, it is not a review of the state of the art. 1/ It is an attempt to define and focus the debate on investment choices. Basic to formulating a new strategy is finding ways to ask the right questions. Only with a new set of questions can the rich and poor in developing countries elicit the information needed to decide for themselves what their educational investment strategy should be.

Section I of the papers reviews a systems approach to learning, related theories and data. In Section II we explore the range of features of educational systems. Data is used from both developed and developing countries. This exploration raises a number of issues which are treated in Section III. Approaches to educational reform and strategy options shape the final Section IV.

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* This paper is a collaborative effort and reflects the ideas of individuals both in and out of the Bank. The extensive and useful comments by more than 30 members of the Education Department/CPS, Regional Education Divisions and the Development Policy Staff on an earlier draft are appreciated. These individuals are not responsible for my commissions or omissions.

1/ The relevant literature on investment in human capital covers the social and health sciences with particular emphasis in economics, psychology, sociology, nutrition and education. See the bibliography for selected reading in these fields.

All readers of this paper are "experts" on education because of their experience. Thus, readers bring a more complex set of biases than usual to our analytic task. For those of you who have not spent significant time recently observing classrooms, talking to teachers and students and reading the work of educational observers, we urge you to become reacquainted with the facts beyond those supplied in this paper.

I. Introduction

The analytic approach of this paper has several levels. At one level the basic features of educational systems are reviewed, the central issues for future investment defined and some guidelines for strategy proposed.

At another level are the theories of human capital formation and the optimal mechanisms for intervention. While we know the optimal proportions of capital and labor to make steel, we do not know with the same precision how people learn. If we did, there would not be the constant debate over optimum learning technologies and reappearance of methods discarded decades ago, like rote learning reappearing in teaching machines. At the final level, and simultaneously, we apply neoclassical economics to explore the efficiency of the production (learning) process, the effect that educational investments have on the productivity of human capital, the economic growth of nations, and finally the effect that educational investment has on the distribution of income.

Some important issues, like education as a human right or educational administration, are not analyzed because of our desire to focus on the economic questions of efficiency, effectiveness and equity. By using this analytic approach we unfortunately raise more questions than we have immediate policy answers.

Several definitions are required to lend precision to the discussion. Schooling and formal education refer to what is taught in school and school-related experiences, such as sports teams and theatre groups. Education without an adjective refers to learning that can take place outside the school as well as inside. Nonformal education refers to organized educational activities that occur outside the school, such as adult literacy courses and agricultural extension services. Learning that is not organized can be termed informal education and includes all forms of nonschool experience.

Structure of Learning

The definitions suggest that investment in education (without an adjective) has important implications for the nonschool inputs. Countries have tended to limit their systematic investment in education to only the formal and nonformal areas. Mass media, activities of political parties and

measures to alter the family environment have been less frequently used as systematic tools for changing attitudes and behavior of either the young or the old. The diagram on the next page outlines the input/output dimensions of a learning system. These dimensions are meant to be suggestive, not exhaustive. Several features of the diagram should be noted: first, the important range of early factors, virtually all of which are now considered outside the scope of either formal or nonformal education in the poor countries; 1/ second, the important interactions (feedback loops) that provide positive or negative reinforcement to behavioral change; third, formal and nonformal schooling appears as only two of the many factors in promoting behavioral change and benefits; and fourth, the diverse range of the outcomes of schooling.

The input/output relationships and their relative importance have been quantified for some societies and will be discussed in Section II. But before discussing this, it is important to explore the possible reasons why the formal system of education has become so important in both poor and rich countries. Mass education was virtually unknown in the world 150 years ago. 2/

Alternative theories. Three basic theories - the human capital, the progressive and the structural - are used to describe the effect of education on individuals and on the economy, and the interaction between them.

Human capital theory suggests that an investment in education increases labor's productivity by embodying in that labor increased skills and knowledge. 3/ While different methods are used to measure human capital, they all are based on the cognitive effects of education. The other two theories stress the noncognitive outcomes of schooling. In accordance with the neoclassical utilitarian paradigm, individual preferences are considered fixed or outside the realm of economic analysis. They are considered inputs, not outcomes, of economic processes. While preferences may change over time, consumption, investment and work preferences are not the outcomes of social institutions such as schools or individual experiences. The policy implication of the theory suggests that increased amounts of schooling for individuals with low schooling will increase their wages and also reduce social inequality.

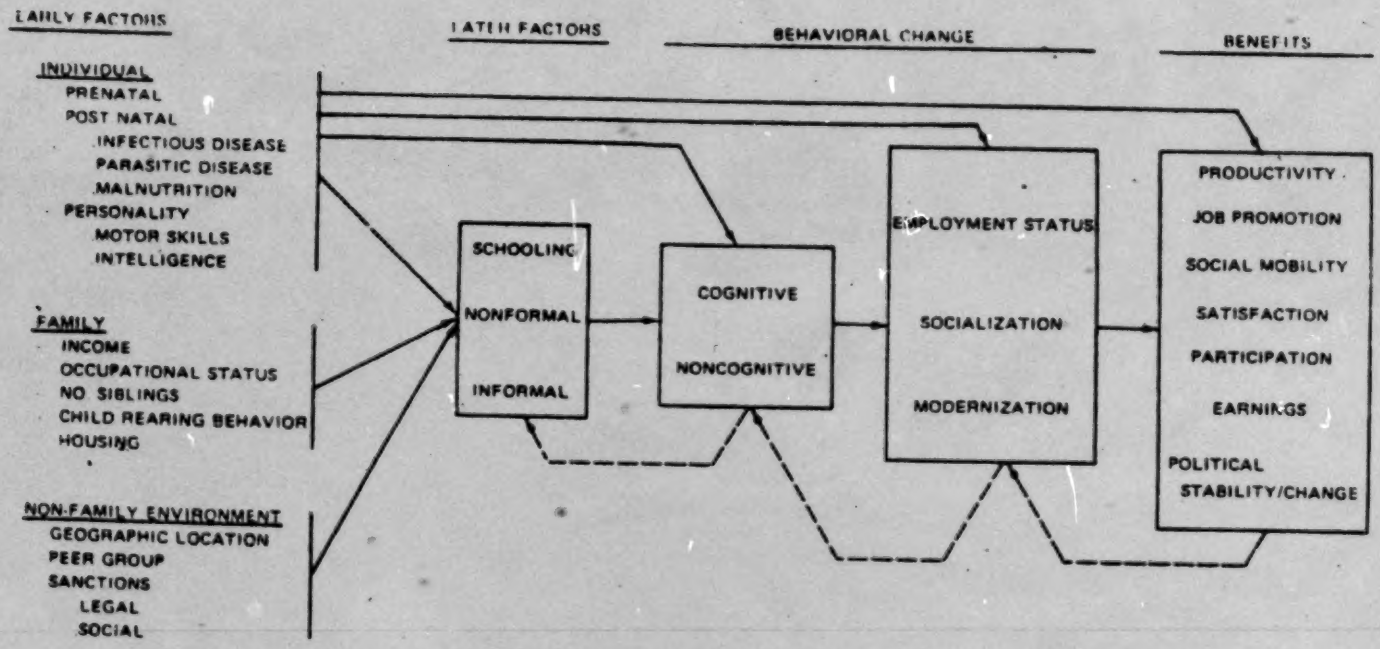
1/ For reviews of some exceptions, see Smilansky (1967), Coombs and Ahmed (1964).

2/ Lawrence ( ).

3/ For an early exposition of this concept see Walsh (1935) and further refinements by Schultz (1961) and Becker (1964).

DIAGRAM I

THE LEARNING SYSTEM: CAUSES, CONSEQUENCES, AND INTERACTION



N.B.. Other arrows are omitted to maintain the clarity of the diagram. For example, Family and Non-family Environment should have dotted lines to Later Factors and Behavioral Change.

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The progressive theory shares the assumption that schooling could perform a productive function by providing skills that are valuable at work. 1/ School skills are defined to include both cognitive outcomes that are the major objective of the schooling process and noncognitive outcomes sometimes referred to as the results of the hidden curriculum. The progressives argue that not only do students not learn many of the skills they need for work, but that they also learn behavior that discourages individual growth and creativity. But the progressive theory does not acknowledge a relationship between the functions of the schools and the structure of the economy. According to the progressive theory, the schools could at the same time both develop individuals to their fullest capacities and provide a labor force. When faced with difficulties in the educational system, the progressives seek to reform the schools by improving the teaching and curriculum. They feel that changes need to be made inside the system, not outside it. A major policy implication of this theory is that, if publicly financed schools provide equal services to all individuals, schooling would be a socially equalizing force in the society.

The structural theory holds that the primary role of education is to produce a work force, not to develop individual capacities to their fullest potential. 2/ The requirements of the work force tend to be defined as behavioral skills needed to fit future work roles. The structure of the social relations of the schools mirror the social relations of work. Students learn to accept nonfamily authority, to develop disciplined work habits, to accept their position in the hierarchy through failure or success on school tests, and to seek rewards by meeting the school requirements.

In preindustrial society, a craftsman had control over both the product and process of his work. He produced and disposed of his own product. Apprentices did not expect to remain in inferior positions, but to become masters. In contrast to this control, modern production uses hierarchical modes of authority to organize firms. The personality traits required for success in most jobs are similar to those traits required for success at most schools. These include subordinancy, discipline, cognitive over affective modes of response, and the acceptance of external rewards. The latter two traits need elaboration. Schools encourage cognitive over affective modes of behavior by penalizing creativity and emotional response.

1/ For the developing countries the literature is limited, e.g. Miller (1972) and Maccoby and Fromm (1970). Also see The School Boys of Barbiana (1971) as a proxy since it describes rural Italy. The literature is extensive for the United States. Examples would include Holt (1970), Goodman (1965), Conant (1959), Friedenberg (1963), Kozol (1968) and Silberman (1970). Jencks et al (1972) make both progressive and structural arguments and reaches structuralist policy implications.

2/ For an exposition of the theory and evidence see Bowles (1970), Gintis (1971), Gignon (1971).

Acceptance of external reward is the substitution of external rewards - such as grades - for intrinsic rewards-like the personal satisfaction of acquiring and possessing knowledge - as the basic motivating force. If this theory is more correct than the others, then the liberating and equalizing functions of the schools as defined by the progressives are in conflict with the productive role of formal education. The policy implications of this theory suggest that basic changes have to be made in the structure of the firm and other economic mechanisms before the disfunctions of the school system will disappear.

Evidence is available to support all three theories. But in the past few years the evidence supporting the structural has significantly increased.

Data. The evidence which will be used to discuss the major issues is drawn from the research in both the rich and poor countries. This decision needs justification. Some readers will argue that it makes little sense to draw upon research related to education systems and their effects in rich and poor countries because the systems and countries are so different. Other readers will argue that the behavior of the learner is the basic question, not per capita income; one must learn whether the education systems' and the learners' behavior vary only in degree, or vary in kind across countries. Stated more formally, are the educational production models used in North Atlantic countries inapplicable, or do variables only have different specifications across countries. 1/

While the data could be more complete, they suggest that the educational production models used in explaining why some students learn more than others, as measured by tests of cognitive achievement, in the North Atlantic countries are also applicable in the developing countries. 2/ A major reason is that learning behavior appears to share common mechanisms across cultures. Another reason for the comparability is that both groups of countries have students with a wide range of ability when they start school. Nigeria may have more students with low IQs and impoverished family environments than Norway, but this is a difference of degree rather than of kind. The educational objectives are similar in both countries. The educational research on the poor countries is fairly recent, and thus it could be argued that it has not stood the test of time. But it is important to note that the cross-cultural similarity in education models is supported by the psychiatric and psychological literature. See, for example, Field (1960), Inkeles (1969), Hunt (1967) and Murphy and Leighton ( ). The burden of proof now rests with those who wish to make the case that the factors which contribute to Nigerian students' cognitive and noncognitive abilities are different from those factors contributing to the same outcomes in Norwegian students' abilities.

1/ The educational production function explains the variance in cognitive and noncognitive behavior of students by measuring dimensions of factor inputs including schooling, parental background, and personality. See Jencks (1972), Husen (1967), Comber et al (1973) and Simmons (1974) for examples of research in both rich and poor countries.

2/ See Alexander and Simmons (1974) for review of this literature and Averch et al (1972) for a review of the methods of the literature.

Some readers will argue that the educational production and behavioral models are too crude to give a sufficiently refined understanding to distinguish between learning processes in different societies. First, all researchers will agree that the models need refinement. But it remains to be seen whether these refinements will add new factors to the models or merely improve the measurement of the existing factors. It would still need to be determined whether or not either of these changes would show substantial cross-cultural differences. Second, the evidence suggests that the processes and structure of formal education vary more within a culture than they do across countries. The elite secondary schools of Rio, Paris and Nairobi, and their products, have more in common with one another than with schools in low income districts in their own countries. The Western models of resource allocation in formal education are used in non-Western cultures with little change. The main variance within these models occurs according to the resources made available to the localities; for example, rural primary schools with few textbooks and inexperienced teachers in Latin America compared to suburban schools in Europe with fine facilities and experienced teachers. Thus, we should not expect significant variations for the factors contributing to the variance in student behavior across countries.

This digression about evidence and methods is not intended to suggest that either are of sufficient rigor to yield absolute conclusions about what schooling does for individuals or societies in poor regions of the world. The next basic step in understanding the determinants of learning will come from the wider application of imaginative policies and experimental methods.

Education, Poverty and Development: An Overview

Developing countries have invested in education for a number of reasons, including meeting manpower demands, encouraging modern attitudes, acculturating diverse groups and providing economic opportunities for the poor.

The strategy for the poor has been to try and increase their access to education. If schools could equalize people's cognitive skills, this would equalize their economic opportunities as adults. The result of the strategy would be to reduce income inequality.

This strategy rests on several assumption: 1) Heredity is a major determinant of poverty: thus, reducing poverty in a society is a matter of helping poor children rise into the middle class. 2) A primary reason the poor do not escape from poverty is that they do not acquire basic cognitive skills. Lacking the ability to read, calculated and articulate, they cannot get or keep a well-paid job. 3) Since poor children do not learn the needed skills from their parents, the best mechanism for breaking this vicious circle is schooling. In the developed countries, the poor have even received programs to compensate for their educationally-unfavorable family background.

The evidence collected in Europe and the United States over the last decade suggests that these assumptions are false. 1/ And the initial evidence from developing countries is similar. 2/ That some people become richer than others is not primarily because they have more adequate cognitive skills.

First, poverty is not primarily hereditary. While children born into poverty have a higher than average chance of remaining poor, there is still significant economic mobility from one generation to the next. 3/

Second, the equalization of reading scores would not appreciably reduce the number of the poor. While children who read well and articulate their thoughts clearly are more likely to have higher lifetime earnings or occupational status, there are other equally important factors involved. 3/

Third, there is no evidence that school reform can substantially reduce cognitive inequality as measured by reading or math tests. School resources do not have an appreciable effect on either test scores or educational attainment.

Among the studies used to make these generalizations are data which support opposing views. But these data are considered exceptional because of the nature of the sample or the analysis. For example, a few schools do produce higher levels of cognitive achievement among their students after controlling as many of the non-school factors as possible. 5/ In general, however, in the national studies, differences between schools and school resources are not reflected in test scores.

Achieving high lifetime earnings and occupational status appears to be more a result of personality, occupational competance, and chance than

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1/ See Averch (1972) and Jencks (1972) for review of the U.S. evidence. See Plowden (1966) for the U.K. See Thorndike (1973) for seventeen developed countries.

2/ See Thorndike (1973) for four developing countries and Alexander and Simmons (1974) for reviews of the evidence for seven other countries.

3/ In the United States, the only country with the best data, there is "nearly as much economic inequality among brothers raised in the same homes as in the general population. This means that inequality is recreated anew in each generation, even among people who start life in essentially the identical circumstances." (Jencks, pp. 7-8)

4/ In the U.S. there is almost as much economic inequality among those who score high on standardized tests as in the general population. (Jencks, p. 8)

5/ Isolating these classroom determinants of achievement is a major thrust of current educational research. They appear to be related to the teacher's personality and experiences other than teacher training.

the result of school-shaped cognitive abilities. In countries where employers hire only mechanics with primary school certificates, then the absence of the certificate is a barrier to higher status and earnings. But the evidence suggests that if the certificate requirement were removed, the quality of the mechanics would not fall. In countries where school dropout rates are high and the percentage of the age cohort getting school certification is low, then the school system acts to limit economic opportunities for low-income children, not promote them. This is not an argument for eliminating formal education, only for recognizing its limitations for dealing with the issue of poverty.

What are the implications for a poverty-focused investment strategy? We should not expect that improving the quality or quantity of educational resources should significantly affect income inequality in most societies. This includes compensatory programs focused on improving the cognitive skills of the poor. Income inequality appears to be more a function of the distribution of personality, luck, political power and physical assets than distribution of the quality or quantity of schooling. Significant changes, however, in strategy could be made to affect the efficiency and effectiveness of educational investment. We now turn to discussion of the economic features of educational systems.

II. Major Features of the Educational Systems

Objectives. Poor countries have invested in education to achieve economic, political and cultural objectives. Literate farmers and mechanics are thought to have better production possibilities than illiterate farmers. Secondary school graduates were needed to perform technical and administrative functions in expanding economies and to replace expatriates. University graduates were needed to supply professional and managerial skills needed in both the public and private sectors. Schooling contributed to political socialization and cultural homogenization. Investment in formal education was considered a major engine of economic growth and the more schooling per person the better; and for the poor, more years of schooling was perceived as the only hope for their children to join the urban middle class..

The transformation of systems of elite education which trained only a small proportion of the school age population to systems of mass education was a pre-independence promise. For adults universal literacy was sought. The supreme importance to political leaders of achieving enrollment targets can be estimated by the fact that targets were achieved and exceeded in many countries, the only sector with this consistent investment experience. The political pressures came from both low and high income groups, which realized that the more schooling and certificates their children accumulated, the better their chance of getting both secure and well paying jobs. Cultural objectives like expanding the use of the national language and deepening the understanding of national history were also important.

The above objectives were translated into a rapidly increasing demand for school places. And, in most countries, the supply of school places has not yet satisfied social demand.

To what extent have the objectives been achieved? And to what extent were they realistic? Before attempting to answer these questions in section III, we first need to sketch some of the other major features of the education and development interrelationships.

Investment. To achieve expanded enrollments, most poor countries increased the proportion of both the national budget and the national income that was spent on education. 1/ For the period between 1960 and 1968, public expenditures almost tripled in one region and doubled in two others, as Table 1 shows. These are public expenditures and they seriously underestimate the total cost of formal education. Educational expenditures outside the Ministry of Education are usually not counted. Both the costs to parents of sending children to school, including income foregone, plus the expenditures on private education, particularly high in Latin America, are excluded. 2/

Table 1

Public Expenditure on Education

(Percentage of increase over 1960 base in current prices)

	1960-1968	Per Annum
Asia	187	23
Africa	114	14
Latin America	136	17
Arab States	91	11
Mean	132	16

Source: Annex Table 5.

Public expenditure on education as a percentage of the GNP went from 2.7 percent to 3.9 percent from 1960 to 1968 for 54 developing countries. This was an increase of 44 percent for the period. 3/ No other sector showed a higher rate of public expenditure. Reliable figures are not yet available on a global basis to indicate the proportion that were capital costs. Estimates range from 15 to 30 percent.

1/ See Annex Table _____.

2/ Some public schools also charge fees.

3/ See Annex Table 4.

In the past investment in formal education was seen as an essential pre-condition to high and sustained rates of economic growth. The experience of the United States, Japan, and more recently Korea, is often cited to support the education-growth causality. At the individual level in every country one observes that people with more schooling have higher incomes. Education investment was also considered essential for achieving political socialization, occupational status, modernization and other social objectives.

More recently, we are beginning to see that high rates of educational output followed rather than preceded initial spurts in economic growth in the above countries. Other factors appear to be more significant determinants of growth. And we find other countries, like India and Ceylon, with high levels of educational output and low economic growth. Beyond some minimum threshold, the rate of investment in formal education cannot be considered to have a linear and causal relationship to a high rate of growth.

Output. The expenditures produced rapid rates of increase in the numbers of students. To exemplify enrollment trends in the poor countries, four countries with different types of economies were selected - Afghanistan, Kenya, Colombia and Brazil. The rates of increase/annum are highest for higher education, ranging from 11 percent in Brazil to 28 percent in Kenya. Primary has the lowest in virtually every country, ranging from 7 percent in Brazil and Venezuela to 11 percent in Afghanistan. The rate of expansion of secondary is similar to higher. In the semilog graphs on the following page, the solid line shows the rate of increase/annum in enrollments by different levels of schooling. Even with massive investment efforts, countries which had espoused universal primary education more than twenty years earlier were, by the early 1970s, far from achieving it.

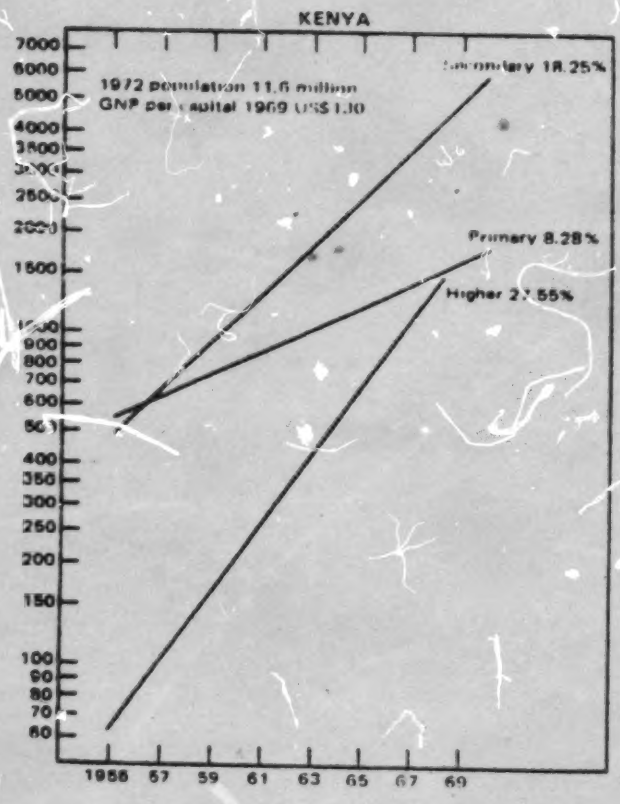
In the past it was thought that the higher rates of output, the better for both the society and the individual. Universal primary schooling was a common goal across countries. Shortages in middle level manpower were projected for decades. And the demand for university graduates would not be satisfied in the planners' lifetimes. Insatiable demand for the school output was the basic assumption.

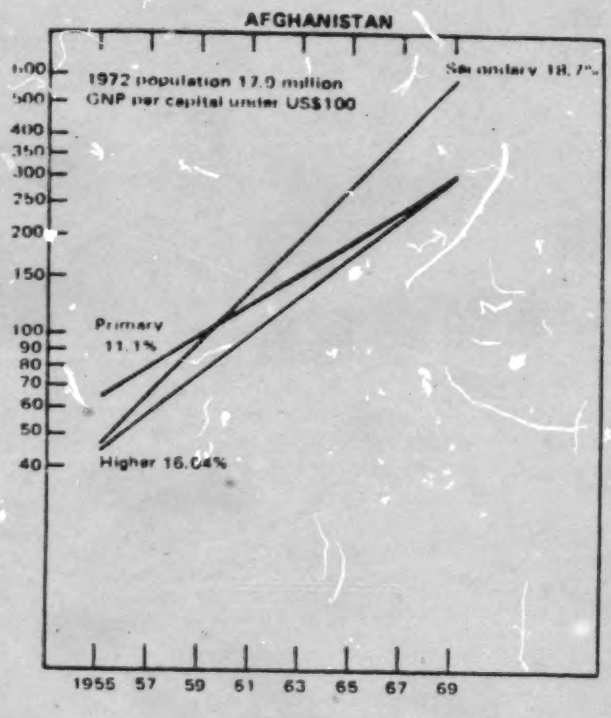
More recently we have seen four reasons why these predictions of output needs were grossly naive. First, population growth was much higher than expected among the school age cohorts, thus forcing countries to delay or quietly abandon the universal primary target. Second, rates of economic growth were often not as high as predicted and jobs were not created as fast as needed to absorb the middle and higher level graduates. Third, planners assumed that new jobs could be filled by school leavers as apprentices or clerks, whereas most of the jobs required experienced workers. And fourth, political pressure from upper income groups forced more rapid expansion of secondary and higher education than originally planned, and primary investment was reduced. Thus, the early manpower and other justifications for high rates of output are now seen in a different perspective.

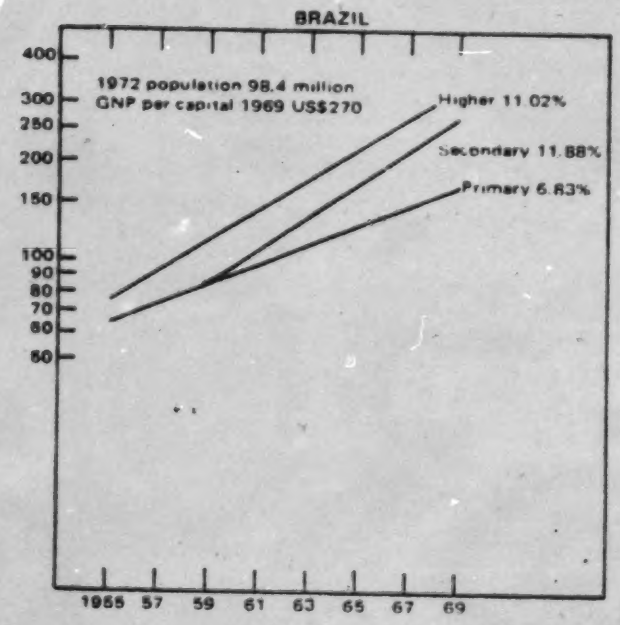
DIAGRAM II

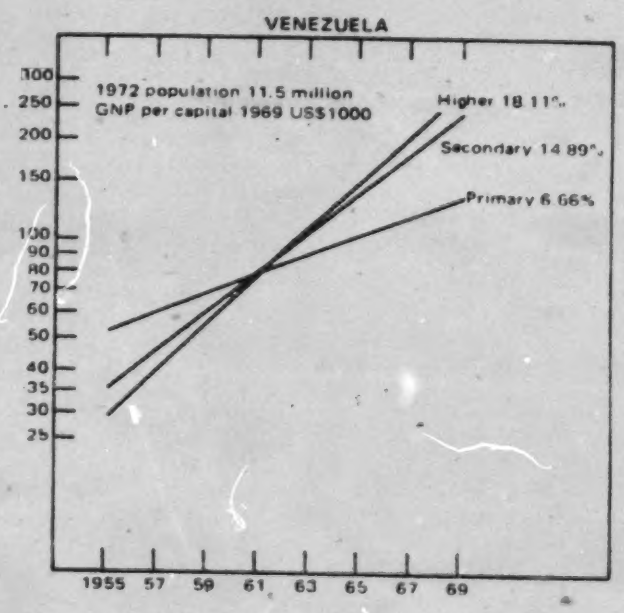
AVERAGE ANNUAL RATES OF GROWTH OF ENROLLMENT RATIOS PRIMARY, SECONDARY, AND HIGHER EDUCATION

(Initial and end point values on vertical axes)









Enrollments at each level.

World Bank - 8485

Internal Efficiency. Turning to the efficiency of the educational system, we should ask, what are the relationships between the inputs of the formal educational investments and the outputs, measured in terms of the quality and quantity of students.

Investment in some aspects in physical capital, like better lighting and science laboratories, could also be expected to increase the quality of educational production. Have increases in real costs per student been translated into increased achievement scores and other measures of school output? Western data suggest that they have not. 1/ The few studies for developing countries are virtually consistent. 2/

There are several reasons for this apparently ostensible anomaly. The first is based on the production function analysis which suggests that the nonschool inputs are more influential than the school inputs. Thus, while replacing existing school buildings of local materials with others of reinforced concrete may make a more pleasing structure and place to work, it has little effect on achievement. Second, as enrollments have expanded under programs of mass education, a greater percentage of low income children are in school, particularly at the primary level. These students tend to have less encouragement at home, suffer brain damage as an effect of malnutrition, fall asleep in class as one result of low calorie intake, and get less attention from teachers than students in upper income groups. Teacher quality usually suffers in mass expansion, including disincentives for keeping the better teachers in rural and low income areas where they are needed most. Thus achievement scores for a district or a country may be stable or tend to fall as real unit costs rise. Questions related to the educational technology have been studied with sectoral and micro-educational production functions. These studies relate both school and nonschool inputs to the different types of schooling output that schooling is supposed to affect. While more of this type research is available for developed countries, some studies are also available for the developing countries. 3/

While earlier studies were consistent in demonstrating internal inefficiency, two national studies completed in 1965 and 1966 (the Plowden

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1/ The data refer to large populations such as whole cities or regions rather than separate schools. While data for individual schools are useful for experimental purposes, they are less so for policy purposes since the resources may not be duplicated quickly or the benefits extended to a large population due to resource constraints. For examples of the western research, see Averch et al (1972), Comber et al (1973).

2/ For the poor countries, see Simmons (1974) Alexander and Simmons (1973) and Thorndike (1973). Schiefelbein and Ferrill (1972) provide evidence that some inputs may have an impact. Some data suggest that increase in real costs are associated with declines in achievement scores (NYT, 1970).

3/ See Simmons and Alexander (1973) for a review.

Report for the UK and Colemen et al for the USA) provided more conclusive evidence. Jencks et al summarized the efficiency and other literature in 1972. While the methods and findings have been criticized, little contradictory evidence has been published. 1/

The findings are quite specific. They show that the present technologies of formal education are very inefficient in their promotion of learning in both the poor and the rich countries. That additional marginal inputs of capital or labor with present technologies have little or no impact on the amount that students learn in school. What seems to be more important in learning subjects that are tested in school are the family environment, peer group interaction, personality, and nutrition. The findings do not study the minimum efforts to reach a learning threshold that could permit self-teaching to take place.

Students in classes of twenty-five learn no faster than those in classes with forty. In fact, some of the evidence suggest that the larger classes produce better learning results. Teacher training courses of four years produce results no better than courses of one year. There is some evidence to suggest that length of teaching experience affects students cognitive behavior, but the effect is weak. Students who have access to well-stocked libraries and well-equipped laboratories in school perform little better than students with poor facilities. While most of this research has been done on education systems in the rich countries, the research results for the poor are similar. One exception comes from Chilean research, where students who have textbooks do better compared to students who do not. 2/ The Chilean result raises an important question. Is there a critical minimum effort or package of inputs required to push cognitive achievement over a minimum threshold? Reaching this threshold would permit individuals to continue learning on their own. For example, having one text book per student, compared to more makes a difference in reading comprehension scores, but 2-5 books per student do not. Similarly, we do not know if classes of ten students would perform better than classes of twenty-five to forty because schools in the surveys did not have less than 25. Private school often have class sizes that are 50 percent of the mean public size. It is unknown if this size is more effective. But halving public class sizes would mean also doubling school costs in developing countries where teachers salaries are 90% of current expenditures. While it appears that increasing unit costs has no significant effect on improving cognitive achievement, we do not know what would happen to the rate of student learning if unit costs of the capital or labor inputs were substantially lowered.

1/ For a critique of Coleman et al. see Bowles and Levin (1968), Mosteller and Moynihan (1971) and on Jencks et. al. see the Special Issue of the Harvard Education Review (1973).

2/ Schiefelbein and Ferrill (1973).

Most discouraging is the finding that the outputs like cognitive achievement which most school systems have been emphasizing, turn out to be of equal or less importance to other behavior skills in securing both employment and job promotion. 1/ The skills the schools have, wittingly or not, either encouraged like discipline or discouraged, and creativity. But we will have more on this in the section on employment.

Other measures of internal efficiency complement measures of the input/output functions. They range from how much children actually learn in terms of functional skills to the rate at which students are dropped or pushed out of school. (A dropout occurs at the student's volition while a push-out is the result of school action.) 2/

Surprisingly little data is available on the functional nature of educational experiences. While studies exist which compare reading scores across countries, 3/ they do not indicate what the score is equivalent to terms of every day functions like reading and understanding a national newspaper. (UNESCO has maintained that four years of primary would be equivalent to adequate literacy.) Data for a North African country, however, suggest that six grades of primary education may not be enough to get a high percentage of students to newspaper-reading level. These data show that seventy-three percent could not read French adequately, sixty-two percent could not read Arabic adequately, and seventy-seven percent could not function adequately in arithmetic. 4/ Although the students surveyed were sixth graders, they had been at school an average of eight years. And the primary system in this North African country has high quality inputs compared to those of many other developing countries. Other reading test results, but not functional or criterion based, support this conclusion. 5/

Wastage rates, including dropouts and pushouts, are an important dimension of internal efficiency. Most developing countries do not have systems of automatic promotion from one grade level to another. Quotas and exams select the desired number of students to pass to the next grade. Some students may be promoted to the next grade or the next level (cycle), but decide for economic or other reasons that they will not continue. Both types of students are measured by wastage rates. Table 2 suggests the rates of primary school dropouts. The data from Latin America and Africa suggest that more than 50 percent of the students who start primary drop out before finishing. Several of the Asian countries in the sample have automatic promotion systems, thus raising the mean level. Secondary school drop out rates are only slightly better as shown in Table 3.

1/ Gintis (1971), Meyers (1972) and Edwards (1972). For research in progress for a poor country, see Simmons et al (1974).

2/ For review of the literature, see Beirn, Kinsey and McGinn (1973).

3/ Husen (1967) and Comber (1973).

4/ Simmons (1973).

5/ Comber (1973), Thorndike (1973) and Simmons (1974).

Table 2: Primary Wastage Rates

Cohorts entering primary school around 1960

(dropouts including pushouts, percentage of total in school)

Countries in Major Regions	Range of Dropout	Median Dropout
Africa	26.2 - 81.3	54.0
Latin America	33.1 - 74.7	61.6
Asia	0.7 - 64.0	20.2
Europe	0.7 - 48.3	18.3

Source: Goldstone (1972), p. 32.

Table 3: Secondary Wastage Rates

Cohorts entering general secondary school around 1960

(dropouts, including pushouts, percentage of total in school)

Countries in Major Regions	First Cycle		Second Cycle	
	Range of Dropout	Median Dropout	Range of Dropout	Median Dropout
Africa	11.8 - 47.7	30.8	7.5 - 61.4	41.9
Latin America	25.2 - 45.0	33.6	8.5 - 28.3	18.5
Asia	0.3 - 36.7	11.8	4.8 - 57.8	18.1
Europe	8.2 - 53.1	20.1	8.2 - 21.8	11.4

Source: Goldstone (1972), pp. 33-34.

If the dropouts occur toward the end of the cycle, do not the students get sufficient benefits? In a few countries dropouts may occur at the end of the cycle. But for most, the wastage proportion is constant at each grade or bunched near the beginning. The data in Table 4 are for an African country with a per capita income of $130 in the latter category. It shows that for the last year measured grade VI, only 36 percent of the entering class reached the sixth grade, and that 51 percent dropped out before reaching fourth grade. Still, these are improvements over the earlier years.

Table 4: Wastage Rates by Primary Grades

Grade	Enrollment in the first grade reduced to 1,000		
	1959/60	1961/62	1965/66
I	1,000	1,000	1,000
II	651	608	674
III	424	428	489
IV	292	304	345
V	96	127	170
VI	64	97	145

Source: Coombs and Hallack (1972), p. 75.

Why are the wastage rates higher for developing countries compared to developed? We can only speculate because good data from developing countries is virtually absent. 1/ First, the supply of school places as a percent of the school age cohort is higher in developed countries, this obviating the need to reduce the number seeking admission as in the developing countries. Finance is the main constraint to expanding supply. Second, the countries' motivation for obtaining more years of schooling is, on the average, less in developing countries. While the poor of the Northeast of Brazil are aware that the Paulistas enjoy high standards of living, in part because of their length of schooling, the probability of the poor getting a university degree is about 0.02. This is not encouraging to most. Furthermore, the children of the rural poor have more responsibilities than just doing well in school like most upper and middle income children. They have errands to run, animals to tend, siblings to look after, and by the time both boys and girls reach age 14 or so, the work of adults. Doing well in school has to compete with other demands among the children of the poor. Finally, the understanding and behavior of poor parents about doing homework and learning foreign languages is not usually as supportive as among upper income parents. In fact, behavior of poor parents, like severe punishment for school failure which encourage children to quit school, is often dysfunctional if the objective is to maximize the child's years of schooling. Thus, the link between motivation and wastage rates across countries is closely related to the proportion of the poor in those countries.

If we combine the analyses of the functional reading data and the wastage data, we reach surprising economic hypotheses about efficiency at the primary level. First, a significant proportion of primary-school students quit school before completing the primary cycle, and thus yield insignificant private or social economic benefits. Second, even if they complete the primary cycle, students may not have achieved even the minimum cognitive skills to have economic utility. And third, if the real economic benefits to primary

1/ See Beirn, Kinsey, McGinn (1973), for a full discussion of this data.

education are minimal, the social rate of return to primary calculations may be measuring the effect of having a certificate in the employers selection process rather than of an increase in productivity caused by primary education.

The unit costs are another dimension of internal efficiency, and are an essential factor in the rate of return calculations in the next section. The data in Table 5 below suggest that (1) the average public expenditure of a year of schooling rises rapidly for the poor countries from primary to the university, and (2) students who stay in school longer get a significantly greater share of public resources.

Table 5: Public Expenditures per Student

(100 - current plus capital cost)

	Uganda	Tunisia	United States
Primary	100	100	100
Secondary	2,917	754	100
Technical (Indust.)	6,595 /a	867	-
Technical (Agri.)	-	1,733	-
University	12,234	4,108	199

Source: See Annex Table 8.

Note: (a) Industrial and Agricultural combined.

Because of the high wastage rates, the cost of producing a graduate, including the cost of those who do not graduate, can be 10 to 20 times higher than unit costs. The data in Table 6 use data from Tunisia which has wastage rates which are about average for most poor countries.

Table 6: Tunisian Expenditure per Graduate

(Current and Capital Cost in Dinars, 1971)

By Level	Dinars/Student	Dinars/Graduate	Index
Primary	24	394	100
Secondary	181	4,398	1,116
Vocational (Indust.)	208	1,955	496
Vocational (Agri.)	416	6,656	1,689
University	986	14,790	3,754
Cumulative			
Primary and Secondary	-	4,792	1,216
Primary and Vocational (Agri.)	-	7,050	1,789
Primary, Secondary and Higher	-	19,582	7,970

Source: See Annex Table 9, 1 Dinar = $US2.08.

In sum, educators and planners assumed in the past a direct, if not linear, relationship between school inputs and improvement in reading comprehension and other cognitive skills. For example, the more years of teacher training the better the students' achievement scores. Or, higher unit costs meant better scores. Failing a quota of children from each year of the primary school was seen as essential to the successful operation of the entire system and the society.

More recently, the data have suggested that the relationship between school inputs and outcomes may be positive, inverse or neutral. Student motivation, the result of many factors including personality, parent behavior and the probability access to higher education levels, is an important determinant of student achievement. The school can no longer be considered a lathe turning out better student products in direct relation to the quality of the curriculum and the intentions of the teacher. Furthermore, to extend the analogy, the lathe and craftsman can damage and misshape the student, particularly among low income groups, to an extent that was unexpected. Finally, the available evidence on efficiency suggests that if major improvements in learning rates are to be achieved, much more effort is required in shaping and combining the non-school inputs.

Benefits and Return on Investment. While some economists feel that no reasonable measure of educational benefits is possible, such an attitude is not shared by most students of the problem. 1/ They suggest that such measures are useful for policy decisions when combined with non-economic information. These benefits include provision of manpower, cultivation and selection of potential talent, and reduced reliance on the market for services requiring basic cognitive skills. Education benefits can be classified as consumption only during the education process. After the period of formal education, the successive benefits are the results of investment because schooling is yielding benefits in future time periods. Important externalities, benefits of education that spill over onto ones' family, neighbors and community, may exist. This would include participation in community affairs, improved productivity from coworkers, lower law enforcement and insurance costs. 2/

Net benefits have been most widely measured by rate of return methods. Most of the rates of social return to investment in education data are based on the lifetime earnings of school-leavers discounted by a suitable interest rate and minus the individual and social costs of the school. 3/ Private rates of return include only the costs to the individual, including income foregone by not working, and thus exclude public expenditures. Both social and private rates tend to overestimate the economic rate of return because

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1/ For an example of the minority view see John Vaizy, The Economics of Education (1962), and for an example of the majority view see Theodore W. Schultz, The Economic Value of Education (1963).

2/ See Weisbrod (1962) and (1964) for an extensive treatment of externalities.

3/ For a review of this method see Blaug (1967) and Bowles (1969).

they do not correct either for the abilities and affective traits that students gain before entering school or for skills gained after school like work experience. The rate of return data are usually aggregated by level of schooling, e.g., secondary, and thus combine variance across occupations. Some data which do make some of these corrections, suggest that the rates need to be discounted up to 50 percent. 1/ Furthermore, the available estimates cover only one point in time and cannot give useful trend information. For these two considerations the rate of return data require careful interpretation.

Important characteristics of the rate of return studies are shown in Table 7. First, the private returns are consistently higher than the social returns. Second, the highest returns are to primary-level graduates; returns to secondary and higher education are usually quite close, but significantly lower than to primary. Third, the social rates of return for secondary and higher for most of the countries are surprisingly close to the social rates for investment in other sectors. 2/ But when these education rates are discounted as suggested above to correct for nonschool abilities, especially family background and work experience, they fall below the rates of return for the other sectors. Fourth, considering the fact that these rates are for one point in time several years ago, and that both unemployment rates among school-leavers and unit costs per student in real terms have been rising, there is strong support for a belief that the present rate of return to education is even lower. These four observations on the social and private profitability of investment in education raise serious questions about the policy relevance of past guidelines.

In sum, the issue is how strong is the evidence for selectively reducing investment in formal education, not eliminating it. Planners assumed in the past that the rate of return figures were useful approximations for justifying public investment in formal education. More recently it has become clear that these figures had less policy relevance due to the measurement difficulties comparing potential investment across sectors. Rate of return is better suited for intra-sectoral analysis.

Employment. A major reason for investing in schooling is that the increased value of human capital would then lead to increases in both the productivity of physical capital and in value added. But as we learn more about the relationships among the characteristics of human capital, and then their relationship to productivity, we are discovering that the cognitive

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1/ For examples of two poor countries where an attempt has been made to correct some biases, see Selowsky (1968) and Blaug et al (1969). Jencks et al (1973, p. 222) corrected the U.S. earnings data for preschool ability and parental socioeconomic status and lowered the private rate of return by 40% and other biases were still uncorrected.

2/ The data in Table 7 use a social discount rate of 10 percent for data on 30 countries.

Table 7

SOCIAL AND PRIVATE RATES OF RETURN BY EDUCATIONAL LEVEL

Country (1)	Year (2)	Social			Private		
		Primary (3)	Secondary (4)	Higher (5)	Primary (6)	Secondary (7)	Higher (8)
United States	1959	17.8	14.0	9.7	155.1	19.5	13.6
Canada	1961	–	11.7	14.0	–	16.3	19.7
Puerto Rico	1960	20.9	23.8	16.0	[a]	24.4	23.0
Mexico	1963	25.0	17.0	23.0	32.0	23.0	29.0
Venezuela	1957	82.0	17.0	23.0	–	29.0	27.0
Colombia	1966	40.0	24.0	8.0	[b]	32.0	15.5
Chile	1959	24.0	16.9	12.2	–	–	–
Brazil	1962	10.7	17.2	14.5	11.3	21.4	38.1
Great Britain	1966	–	3.6	8.2	–	6.2	12.0
Norway	1966	–	7.2	5.4	–	7.1	4.5
Sweden	1967	–	10.5	9.2	–	–	10.3
Denmark	1964	–	–	7.8	–	–	10.0
Netherlands	1965	–	6.8	6.0	–	8.4	10.4
Belgium	1967	–	–	8.6	–	–	25.0
Germany	1964	–	–	–	–	–	4.9
Greece	1964	–	3.0	8.0	–	3.0	14.0
Israel	1958	16.5	6.9	6.6	27.0	6.9	8.0
India	1960	20.2	16.7	12.7	24.7	19.2	14.3
Malaysia	1967	9.3	12.3	10.7	–	–	–
Philippines	1964	8.0	21.0	11.0	8.5	28.0	12.5
Japan	1961	–	5.0	6.0	–	6.0	9.0
S. Korea	1967	12.0	9.0	5.0	–	–	–
Thailand	1970	18.5	11.0	11.0	26.5	13.0	14.0
Hawaii	1959	24.1	4.4	9.2	[a]	5.1	11.0
W. Nigeria	1966	23.0	12.8	17.0	30.0	14.0	34.0
Ghana	1967	18.0	13.0	16.5	24.5	17.0	37.0
Kenya	1968	21.7	22.9	8.8	32.7	35.2	27.4
Uganda	1966	66.0	28.6	12.0	–	–	–
N. Rhodesia	1960	12.4	–	–	–	–	–
N. Zealand	1966	–	19.4	13.2	–	20.0	14.7

Notes: [a] over 100.0
[b] over 50.0
– Not available

Source: Psacharopoulos (1972)

benefits of schooling may not always have a significant impact on productivity. 1/ Thus, the essential assumption of human capital theory is in question. 2/ This needs some explanation because it appears to be inconsistent with the early empirical research.

The early studies showed a modest correlation between the per capita income level of a country and the average amount of schooling of the population. 3/ But correlation studies of this type are no indication of causality. The investment in schooling could have just as well followed rather than preceded the higher per capita income levels.

1/ The US evidence is derived from studies measuring the relationship between the level of cognitive achievement of students and their productivity measured by lifetime earnings of occupational status. Cognitive achievement is measured in various ways including national examinations, rank in class, and grade point average. Controls are usually made for years of schooling and parental socioeconomic status. IQ is usually not controlled since it is a measure of cognitive ability and thus strongly correlated with other measures. The results tend to show that the relationships between cognitive achievement and productivity are minimal, when they exist. See Collins (1971), and Bowles and Gintis (1973) for reviews of the literature.

IQ and income show a very modest relationship. The incomes of American men with IQ genotypes above the 80th percentile in the IQ genotype distribution were compared with men below the 20th percentile. The incomes of the top 1/5 IQ genotype were only 35-40 percent higher than the lowest 1/5. This is not a major difference when the men in the top 1/5 of the income distribution earn 600 percent more than the worst paid 1/5. Individuals with the same IQ genotype show at the most only 3 percent less income inequality than in the entire American population. Jencks et al (1972), p. 220 ff.

2/ See Schultz (1961) and Becker (1961) for human capital theory and Bowles (1970), Edwards (1972), Gintis (1971) and Jencks et al (1977) for syntheses of the evidence which challenges the theory.

3/ For example, Svennilson, Edding and Elvin (1961).

Other studies using macro production functions attributed the residual variance in output that was unexplained by the value of capital and the quantity of labor to the increase in quality of labor. 1/ In other words, whatever was unmeasured was due to the effect of schooling. The research was not designed to examine the effects of education, and the educational speculations trying to explain the results have not been supported. For example, from micro and sectoral research we would expect informal education outside of school, including on-the-job experience, to be more important than schooling in explaining this residual. 2/

We lack sufficient evidence about cognitive and affective thresholds. At what point in the development of a certain cognitive trait does an individual have sufficient ability that he or she can then continue to develop it without the assistance of formal education? For example, are there minimum levels of reading comprehension lessons or psychomotor skills? A threshold at which students can learn on their own? What other skills provide the necessary and sufficient conditions for attaining and then retaining this reading threshold? This question is basic for understanding the policy options for developing countries desiring to optimize the benefits from investment in schooling.

A major feature of the labor force in a growing number of poor countries is the educated unemployed. Because of the limitations of the data, all we can say is that the levels of educated unemployed are high compared to developed countries. 3/ Underemployment of the educated is also becoming serious when secondary school leavers take the jobs once effectively performed by primary graduates. And in these same countries expatriates often still hold jobs. For the last ten years in Tunisia, 50 percent of the secondary and university teaching positions have been filled by foreigners, while graduates financed by state scholarships become unemployed, underemployed, or emigrated. 4/

1/ Solow (1957), Denison (1962).

2/ When inputs were unchanged, output increased at one percent per annum at a firm in Horndal, Sweden, and is attributed to experience. See Lindhof ( ) for the Horndal effect. See also Arrow (1902), Mincer (1962), Zilstov (1969) and Simmons (1973) for studies on the effects of informal education. Other evidence suggests, for example, Berg (1970), that for each occupation there is an optinum amount of formal schooling. Thus, in some cases, labor productivity declines as schooling increases.

3/ Blaug (1973), p. 7-11. The employment data required to understand the full dimensions of this problem need to be crosstabulated by age, schooling, length of unemployment and hours worked/week and are virtually unavailable.

4/ Two reasons seem to explain this contradiction. First, incentives and streaming were insufficient to obtain enough secondary math, science and language teachers among the mix of university graduates. Second, teachers of French nationality were offered to the government on concessionary terms.

Even in countries that have high levels of educated unemployment in say engineering, there often remains a high level of demand for places in engineering. 1/ This apparent contradiction can be explained. Although the chances of getting a job as a secondary school teacher may be better than getting a job as an engineer, the higher lifetime earnings of an engineer mean that it is worth taking a longer time as unemployed if there is a chance of getting an engineer's job. Because university leavers tend to come from upper income families, they can easily rely on the family for economic support while looking for a job. Thus the private incentive to get a job is much less for many of the educated unemployed.

Large wage differentials between occupations are major reasons for educated unemployment and increasing inequality in income distribution. This paper is not the place to review the inefficiencies of the labor market particularly wage distortions. But it is important to point out that the classical rationale of the incentive of wage differentials no longer applies when a mechanic earns ten times as much as an agricultural laborer, or a doctor earns 100 times as much. An adequate supply can be achieved at much lower wages. Table 8 indicates wage differentials by amount of schooling for Uganda, India and Brazil. The Uganda secondary school graduate's average salary is 20 times the per capita income, for India it is about 8 times. In Brazil, university graduates earn more than 16 times the average income of illiterates. While in the rich countries these differentials seem to be shrinking, in the poor there is some evidence to show that they are expanding. 2/ Thus, the lifetime incentive of getting a certificate may be increasing. And it may not be until wages are realigned that the uneconomic incentives for more schooling will be reduced.

In short, we observe the following seemingly contradictory, phenomena:

(i) relative wage differentials between graduates of different levels are either widening or relatively stable;

(ii) there is in general, an oversupply of higher level graduates, as indicated by unemployment data.

Why is the market mechanism not operating to reduce differentials, given this oversupply?

One interpretation goes as follows:

(i) More education does not by itself raise the productivity of labor. Job experience is required in addition to the education. This appears to be borne out by age-income profiles for education levels. Beginning

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1/ Blaug, Layard and Woodhall (1969).

2/ See IBRD: Tunisia Report - Basic Economic Mission - Chapter 22 (1974).

Table 8

AVERAGE YEARLY SALARIES BY LEVEL OF EDUCATION IN UGANDA, INDIA AND BRAZIL

(£)

Educational Level	Uganda (1965)	India (1960-61)	Brazil (1970)
Illiterates	-	-	114
Primary	-	-	243
Junior secondary/middle	209	131	-
School certificate/secondary	556	185	489
Higher certificate/Indian graduate/Brazilian college	852	311	698
Ugandan graduate/Brazilian higher	1,373	-	1,731
Income per head	28	25	175
Salaries as multiples of income per head			
Junior secondary/middle	7.3	5.4	-
School certificate/secondary	20.0	7.7	2.8
Higher certificate/Indian graduate/Brazilian college	30.4	12.4	3.9
Ugandan graduate/Brazilian higher	49.0	-	9.9

Notes:

(a) the data refer to average earnings over all age groups;
(b) the data for Uganda refer to civil service earnings and those for India to average urban earnings;
(c) Indian earnings are converted from Rs. to £s at the 1961 exchange rate;
(d) under educational level, that for Uganda is shown first, followed by the roughly comparable Indian, then Brazilian level;
(e) Brazilian earnings are converted from NCr. to £ and income per head from US$ to £ at the 1970 exchange rate.

Sources:

(i) Uganda: J.B.Knight: "The determination of wages and salaries in Uganda", in Oxford University Institute of Economics and Statistics, Bulletin, Vol. 29, No.3, August 1967, pp. 233-264.
(ii) India: Mark Blaug, Richard Layard and Maureen Woodhall: The causes of graduate unemployment in India (Allen Lane, Penguin Press, 1969) table 7.1. The table for Uganda and India was cited by Jolly and Colclough (1972), p.230.
(iii) Brazil: Langoni (1972), Table 4.14, cited by I.M.Hume, "Notes on the Distribution of Income in Brazil", IBRD, 1972.
Income per head is from 1973 World Population Data Sheet - Population Reference Bureau Inc., and is IBRD data.

wages are, of course, higher for higher levels of education. More importantly, the rate of increase of wages over time is higher for higher levels of education. 1/ This effect is illustrated for India in Diagram 3;

(ii) Consider, then, the time-path of a developing economy with a rapidly growing populaton, falling age structure and rising enrollment rates at all levels. The growth rate of graduates from higher levels of the education system will significantly exceed the growth rates of the economy and the modern sector. If the crucial modern sector inputs are capital and labor with schooling-cum-experience, then rising wage differentials are consistent with high levels of unemployed graduates in the early years after graduation and consequently high levels of unemployment for graduates (which category has a young age structure) in general. This phenomenon is illustrated for India in Table 9, where the average waiting period for employment of graduates has increased over time;

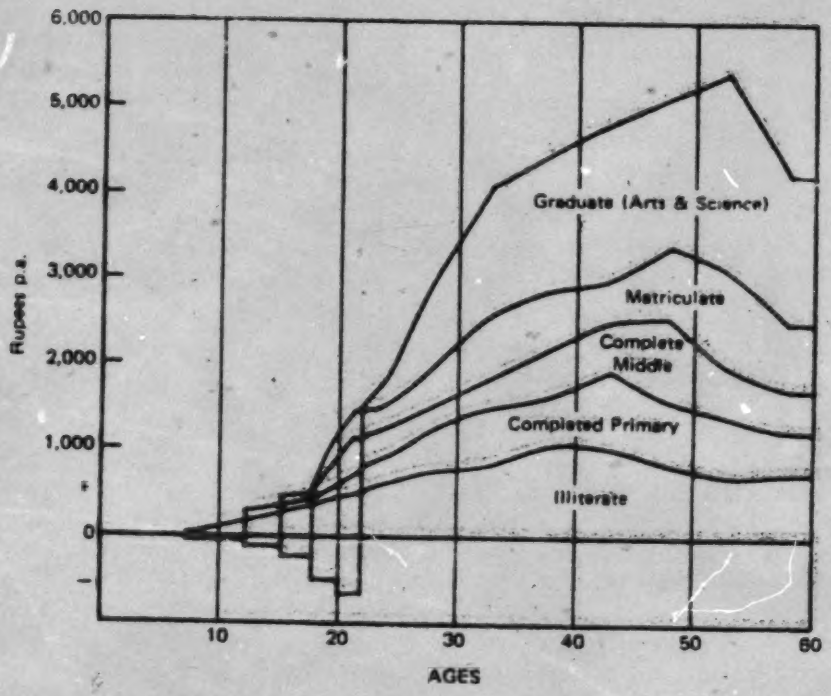
(iii) It is not surprising, therefore, that students continue to pursue higher levels of education despite the rising level of graduate unemployment. Given that costs are highly subsidized, and that the foregone earnings of education levels without experience on the job are small in comparison to wages with education and experience, the risk of unemployment in the early years is less significant than the possible maximum return; and

(iv) From a social standpoint, however, this demand for more education is not optimal. It is unlikely that the modern sector will grow rapidly enough, given capital shortages, to provide the necessary employment of this high-grade manpower. Already, increasing waiting periods push back the time when the high level graduates will have gained on-the-job experience and decreased the social return. In general, therefore, it would be advisable to suppress the demand based on low opportunity cost and high private returns, and to divert the capital so utilized into employment creation at the lower educational and skill levels. This not only would improve the income distribution immediately, it would also, by increasing the base of the modern sector job pyramid, and thus improving the productivity of the supply of manpower for the top of the pyramid, increase growth prospects.

1/ Human capital theory would suggest that more education enables one to learn faster on the job. Progressive theory would suggest that the education system was selected the more able people, not added much that was useful, and thus we would expect the more able to learn more.

DIAGRAM III

AGE EARINGS PROFILES FOR INDIA



1.4 Age earings profiles by level of education, Urban India, 1960/1

Note: The diagram shows earings before tax, and social costs of tuition unadjusted for wastage.

Source: Blaug, Layard, Woodhall (1969) p21.

World Bank-8487

Table 9

1954 Graduates: By Year in which First Employment was Obtained

Year of First Employment	Percentage of Graduates (1)	Assumed Average Initial Waiting Period (years (2)	Col (1) X Col (2) (3)
Already employed	25.0	0	0
1954	25.0	1/4	6.3
1955	18.2	1	18.2
1956	12.0	2	24.0
1957	6.9	3	20.7
1958	4.0	4	16.0
1959	1.7	5	8.5
1960	0.6	6	3.6
	93.4		97.3
Not available	6.6		
	100.0		

Notes: (1) The table relates to those graduates employed in 1960 and excludes the 9.8 percent unemployed.

(2) In estimating column (2) it is assumed that students graduate at the end of June when exam results become available.

Source: Blaug, Layard, Woodhall (1969), p. 79.

In sum, some past observers have felt that there was some synergistic relationship between schooling and employment creation. More recently it has become clear that education cannot make a major contribution to reducing unemployment. There are exceptions only to the extent that: (i) nationals would be allowed to take the place of expatriates, and (ii) jobs were created in the education sector. Schools do shape the behavior of individuals in such a way that they are more attractive to employers, but so far, eliciting many of the desired behavioral traits has been an implicit, not explicit, part of the curriculum and educational system.

A basic issue in allocating education resources is the trade-off between investment in different levels of educatio given the probabilities of unemployment and the social rate of return. Given the available data on both these assumptions for countries that are pursuing a development strategy of growth with income redistribution, shifts in investment to lower educational levels to achieve both quality and quantity objectives may be called for in many countries. And fo some countries faced with a significant

proportion of the population living below subsistence levels, the shift of education resources to agriculture can be justified on employment, efficiary and equity grounds in order to increase calorie intake/day and thus labor productivity, agricultural output and welfare. These trade-offs have not been seriously considered because of the unassailable benefits to education investment which have been assumed in the past. The new evidence on the contribution of education to productivity, plus the possible need to reallocate among the poorest countries by the rising energy and related costs, make this reexamination imperative.

Income Distribution. Schooling, the poor quickly learn in most countries, is an escape from poverty for only a few. The poor are the first to dropout because they need to work, the first to be pushed out because they fall asleep in class as one result of malnourishment, and the first to fail their French or English tests because upper income children have had better opportunities at home. The hope brought to village parents by the construction of the primary school soon fades. Enough schooling to secure a steady, even menial, job for their son, let alone for their daughter, seems just beyond their grasp. They are never one of the lucky parents. Before they had a school, any schooling would have done to achieve their aspiration. Now a primary school certificate is needed, and some are saying that even students with some secondary schooling cannot get a steady job; and they could never afford to send their son away to town for secondary.

Does schooling widen the gap between rich and poor? Better data and models for examining this question are only now becoming available. 1/ The data are consistent in indicating that the children of upper income groups tend to get more years of schooling than low income children. 2/ In Tunisia, 8.8 times the number of students with high socioeconomic status fathers are getting some higher education than one would expect from the proportion of high SES students in the population (See Table 10). When this process is repeated in the next generation, schooling is thus a factor for widening the gap between rich and poor.

While schooling is not the only factor in increasing social inequality, it appears to be an essential one because it legitimizes the achievement of high-status occupations and increases the human capital of the rich. Students enter school with considerable differentials in their abilities. Some of these abilities are genetically determined and others are determined after birth by the environment. 3/ Children from upper income groups tend to begin school having been better nourished, better cared for, and more exposed to situations conducive to developing cognitive and noncognitive skills useful in school and white-collar work than children from low income groups. For example, in many poor countries a second language is begun in primary school. Children coming from homes where this language is spoken have a considerable advantage over children who do not.

1/ For a review of the methods and data see Dasgupta (1974) and Jallade (1973).
2/ See Dasgupta (1973) and Bhagwati (1972) for India.
3/ For an excellent review of the evidence and controversy, see Jencks et al (1972), Appendix 1. See also Herrenstein (1971).

Table 10: Socio-Economic Status of Students' Fathers (1970)
(percentage)

Socio-economic Status	Primary (1)	Secondary (2)	Higher (3)	Ratio (3)/(1)
High 1	1.2	5.9	10.5	8.8
2	26.5	40.0	26.2	1.0
3	12.7	20.8	17.6	1.4
Low 4	43.5	17.3	11.9	.27
Other	16.1	16.0	33.0	
Total	100.0	100.0	100.0	
n Students (000)	113.9	7.8	0.6	

Status: High 1: Highest white collar, professions, heads of firms and employees Category A.
2: Employees Categories B and C, businessmen and skilled workers.
3: Foremen, semiskilled or unskilled industrial workers.
Low 4: Agricultural laborer and non-industrial unskilled workers.
Other : Retired, without occupation and father dead.

Source: Ministere de l'education Nationale, Bureau de Planification, Tunis.

Once the student gets to school, promotion is based on performance in cognitive achievement and other personality skills. In contrast to primary school systems of the rich countries, primary schools in many poor countries do not have a system of automatic promotion from one grade to the next. Rather, children who do not get a minimum composite score for their courses, or sometimes if they only fail one course, still have to repeat the grade. This often encourages the failure syndrome. Students who repeatedly find themselves scolded for failure and low marks learn to expect to fail. Their confidence is eroded. They lose their hope of succeeding. And this attitude of expecting failure in academic subjects is carried over into activities outside the school. Thus upper income children who enjoy the combination of more developed cognitive skills before entering primary school and a system of promotion that immediately bgins to reinforce their positive behavior and discourages the behavior of their low income peers have a much higher probability of gaining more years of schooling. So much for the gross benefits of schooling.

Other Features. Important subjects have not been discussed that require mention. They include the effect of education on modernization, political socialization, fertility, migration and acculturation. These effects are often used as additional justifications for investing in schooling. While the data are more limited than for the features mentioned above, they tend to be consistent in showing that the effect of more years of schooling on behavior is much less than expected. Early studies on the subjects often over-emphasized the strength of the relationship because of crude research methods based on either simple correlation analysis which did not control for other factors, or absence of experimental methods.

Do more years of schooling lead to higher levels of political participation? Participation is defined by several variables including voting, attendance at political meetings, contributions to parties, interest in politics, discussions of politics, and attempts to influence political decisions. Research in India shows that, while more educated people discuss politics more frequently, and are more likely to try to affect decisions, the educated individual shows reticence in voting or going to political meetings. 1/ A study in Japan concluded that voting participation is higher in rural than urban areas and that voting does not seem to increase significantly with the rise in level of education. 2/ Evidence from Tunisia indicates that the more years of secondary schooling an individual has the more likely they are to be alienated from the ruling party. 3/

Other Indian research suggests that educated individuals are more likely to support nondemocratic forms of government than uneducated. They are more likely to say that it would help the country if the army took over the government. 4/ Myron Weiner has concluded that "It is a popular though unfounded myth... that the collapse of party government in such places as Pakistan, Burma and Sudan was a consequence of mass illiteracy and poverty." 5/

The modernization of attitudes and behavior has received considerable emphasis by both politicians and social scientists. There is general agreement among western trained social scientists to the characteristics of modern individuals. The modern individual shows a readiness for new experience and an openness to innovation, is disposed to form or hold opinions over issues that arise both inside and outside his immediate environment, is aware of the diversity of opinion around him, is oriented to the present and the future rather than the past, believes in planning and organizing as a way of handling life, has a sense of efficacy, and believes that individual rewards should be according to the contribution and not according to hierarchial position. 6/ While these are thought to be held by important proportions of individuals in industrialized societies, they also characterize ancient societies like the

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1/ Goel (1970).

2/ Richardson (1966).

3/ Taylor (1974).

4/ Goel (1970. Another Indian study found no relationship between education and political authoritarianism (attitudes that are proper or antidictatorship). Elder (1966).

5/ Weiner (1965).

6/ Inkeles (1966).

Greeks and Mayas. While the economic and cultural relevance of these values for both the poor and rich countries need wider discussion, some national leaders feel that the modernization of attitudes and behavior is an important objective.

Do schools raise the level of modernization of their students? Are the higher levels retained after leaving school? Are the individuals with modern traits rewarded with higher earnings and satisfaction? While the state of the studies is in its infancy, the data from several countries suggest some tentative answers. Significant variance on each of the above characteristics exists with each of the more than seven countries studied. For example, urban groups have higher levels of modernity than rural. What causes these differences is unclear. Briefly, schooling seems to have an impact, although there is considerable variance within countries and across different levels of schooling. Tunisian primary students do not seem to become more modern during primary, but students with some years of secondary do. 1/ But in one of the few studies on the economic relevance of modernity, the possession of modern traits did not have an impact on the earnings of Tunisian blue and white collar workers. 2/ Thus the available evidence suggests that, while schooling seems to enhance modern traits under some circumstances, its economic significance is less clear. This discussion of political socialization and modernization is not exhaustive, but it should raise doubts about the effectiveness of schooling.

We have not systematically reviewed the evidence in other areas that schooling is supposed to affect, like fertility, migration, delinquency, alienation and acculturation. Our initial impression, however, is that most the evidence is based on simple correlation studies which have virtually no policy relevance.

We now turn to a discussion of the implication of the educational features for understanding the major issues in formal education.

1/ Erkut (1972). See Inkeles (1974) for data on six other countries.

2/ Simmons (1972), Sack (1972).

III. Major Issues in Formal Education

In the preceding discussion of the features of educational systems in poor countries a number of problems emerged. In this section the basic issues will be explored and priorities assigned. We therefore continue our search for the right questions. One pitfall should be emphasized. The research and experience of the past twenty years has emphasized the importance of understanding investment in education from a general equilibrium rather than a partial analysis. The application of this approach in the next twenty years will probably show the inadequacies of our present understanding. 1/

The basic criterion for the selection of issues are their economic importance, including efficiency, growth and equity dimensions. While this will coincide with some countries' investment criterion in education, it may not for others more concerned with political unity or acculturation. A second criterion of choice is the extent to which the issue is relevant to a significant number of countries. While the question of whether to extend the secondary cycle from six years to seven may be the major national controversy in some countries, it is a minor concern from a global view.

The final digression concerns what constitutes an issue. A policy issue is an important subject about which opinions of decision makers may differ. A policy issue is also timely, since decisions about it could affect future outcomes. Thus, this section will try to reveal different dimensions of a limited number of policy issues.

The resource constraint. Most developing countries face a basic dilemma. Future resources will not be sufficient to support present trends in the expansion of school places. An increasing number of countries are finding they can no longer afford an expansion of capital and current budgets for education at the expense of reduction in other sectors. Most of the exceptions are the smaller ones with major oil revenues. The issue has three possible outcomes. Countries can:

(a) Continue to transfer resources from other sectors of the economy to augment those now available for formal education;

(b) Maintain present levels of resource use, but increase the intensity of use. e.g., use school buildings on double shift basis like Singapore or hire more teachers at lower wages; or

(c) Reduce the resources available to formal education.

1/ When we are confronted with a mess, we try to break it down into definable problems. But, by definition, the residual of undefined problems may remain. And they may be the critical ones for understanding, if not solving the mess.

It is possible that resources with a near-zero opportunity cost could be created and used in educational production. For example, construction of schools with voluntary labor and classroom teaching by volunteers or low cost apprentices. 1/ But this is not sufficient given the new resources required at present trends.

Each alternative has advantages and disadvantages depending on a number of factors ranging from the clamor of the other sectors which face potential reductions to the political pressures to expand the costliest levels of education. How each factor would be weighted will be country specific. But given the continued high rates of expansion of the social demand for school places, the sooner this issue is confronted the less costly the solutions will be.

Ineffectiveness. How effective is an additional year of schooling in increasing an individual's life-time earnings, social mobility or level of satisfaction? The input-output and rate of return analyses suggest that schooling is less effective than we had expected. An additional year of primary or secondary schooling may have little effect on earnings or other outcomes. And this may be as much a result of the over supply of school leavers in the labor market as a result of the effect of schooling on human capital. But for whatever reason, parents and planners in a small but growing number of countries are realizing that an additional year of schooling does not guarantee a higher social or private rate of return to their investment. 2/ For some types of schooling, marginal costs may be higher than marginal benefits.

Schooling develops both cognitive and non-cognitive traits, but the non-cognitive traits are not usually part of the curriculum. For example, failure in school can weaken self-confidence. School failure is effective in both conditioning them for low status jobs and then legitimizing their low place in the occupational hierarchy. 3/ The data increasingly suggest that employers, when hiring new workers, emphasize the importance of the non-cognitive traits. Because the development of these traits are not an explicit objective of the schooling process, school resources are not effectively used to achieve the objectives. Schooling is a strong socializing influence. In many poor countries, school is so effective in socializing secondary students to white collar occupations that they prefer unemployment to manual jobs. From the view of the poor desiring to learn the traits needed for unward social mobility, it may be ineffective; from the view of the elite and threatened with downward mobility, it may be effective.

1/ The suggestion of volunteers and apprentices may appear heretical to some readers, but they have been used extensively in the developed countries at all levels.

2/ As we have stated in Section II (e), the rate of return results of the traditional estimations should be discounted by approximately 40% to give a more accurate estimate. Finally, no past studies have been able to separate accurately the certificate effect on earnings from the learning effect. See Carnoy, Thias, and Sack (1973) and Simmons (1973) for suggestive results.

3/ Kohn (1964), Gintis (1971).

The issue is how to improve the effectiveness of the investment in human capital. The issue has two dimensions. First, how can the formal education system become more effective in achieving both individual and social objectives? Second, are there alternative or complementary investments which cound also achieve these objectives at less cost? Basic to the effectiveness issue is determining what tasks schools can best accomplish and which should be left to other institutions. Determining what these are, is the domaine of internal efficiency which we examine below.

To deal with the ineffectiveness issue, some countries might launch an educational reform commission to explore the strengths and weaknesses of the system. But when their report is submitted, only minor and piecemeal changes would be made. Other countries might seek the educational reform experience of other nations without considering the adaptations which would make them effective.

Improving effectiveness has two complementary dimensions. First, the decision-making framework should be broadened to include the producers and consumers of formal education. This would promote a national awareness about the ineffectiveness of education, and its relation to the labor market and social change. Second, based on an exploration of promising innovations, a modest but long-term program of research and development should be begun to define and answer the questions about ineffectiveness.

The myth of the immutable effectiveness of formal education is withering rapidly especially among low- and even middle-income students and parents who find that more years of schooling do not increase the probability of getting a secure job - or even of getting any job at all - as much as they did in the past. Observers are becoming alarmed at the political and economic implications of the educated unemployed. The real, not the imagined, effectiveness of formal education is a central issue in educational planning and investment.

Inefficiency. Two major issues are basic to improving the internal efficiency of educational production. First, what factors contribute to primary school graduates reaching an adequate level of reading comprehension? What is the optimum way to increase the percentage of the primary school graduates who master the basic cognitive skills? Dimensions of this issue include maternal and child care, nutrition, dropout rates, examination systems, learning methods, and the availability of primary school places. The emphasis is on the primary level because progress there will have significant import on both the internal efficience of the higher levels and the income distribution effects of educational investment.

Second, how can the rising trends in unit costs at all levels of schooling be reversed? Dimensions of this issue include wastage rates, the wage levels of teachers and the wages of competitive occupations, the use of imported goods and services for both the construction of new schools and the development of course materials, and new ways of combining labor and capital (i.e., more efficient technologies) to maintain levels of cognitive achievement at less cost. For example, buildings could be used more intensively, or for noneducational purposes. Lower cost paraprofessionals could assist both in the classroom and as tutors.

The combined issues suggest several possible actions for a concerned country:

(a) Establish a commission of the producers and consumers of formal education to measure and review the inefficiencies at each level and propose a strategy for innovation;

(b) Establish cost accounting techniques, initiate educational production function studies, and organize human resource planning and management units in the Ministry of Education to provide the relevant information and analysis for investment decisions;

(c) Based on learning research which indicates that the factors most important to cognitive and noncognitive achievement lie outside the formal education, decide to intervene in these traditionally nonschool areas with pilot projects as part of an integrated program for investment in human capital;

(d) Shift resources from vocational, secondary and higher education to assure that the best efforts of the education sector are made to improve the quality of primary education. While this would imply an increase in the unit costs of primary education, it would not mean an increase in total educational costs; and

(e) Combination and permutations of the above possibilities.

These five options are not meant to provide a comprehensive program for improving internal efficiency. Rather, they should suggest possible wages of beginning to explore two basis issues.

Inequality. For some decision-makers in countries like Tanzania, Cuba and China, the motivation for greater income equality has been translated into action in all the sectors of the society. The elite in other countries are divided as to the best route to greater income equality, some suggesting that greater inequality now will mean higher standards of living and greater equality in the future. 1/ And in a few countries the debate on the causes and consequences of inequality is virtually unheard.

The evidence suggests that investment in formal education tends to increase rather than diminish income inequalities. Assuming that the national elite is interested, the issue, therefore, is to devise an investment strategy that uses the formal education mechanism to help narrow the incomes gap. The options depend as much on the motivation for equality, and the political security of the elite, as they do on the sound design of the options. They are:

1/ For a review of the growth and equity issues, and policy suggestions, see Chenery and Associates (1974).

(a) If we assume that the educational structure 1/ and processes 2/ cannot be changed in the medium term, then we are left with reallocating the educational budget to reduce the education resources going to the children of high-income families and increase them going to low-income families. Without other changes within the sector and outside it, it is unlikely that this option has much potential;

(b) If we assume that the educational structure will not change but the processes can be modified with increasing equity as the main objective, then the system of selection, examination, promotion and financing could be modified to favor low-income children. 3/ This would have a significant impact on reducing inequality if it could be implemented;

(c) If we assume that both the structure and the processes can change, then private systems , ranging from tutoring to universities, can be managed for social objectives. The government's monopoly of formal education could be ended, and thus increase the use of local resources, initiative, imagination, and management; 4/ and

(d) If we assume that both the structure and processes can be changed and that, at the same time complementary efforts are made in macrpeconomic policy like narrowing the trends in income differentials decertifying the hiring practices of employers, and taxing the benefits of education, then the possibility that educational investment could reduce inequality is sharply improved. Even the most drastic educational reforms, if isolated from the economic mechanisms, are not likely to achieve even modest equity objectives.

1/ e.g., Public/Private and Primary/Secondary?Higher.

2/ e.g., Curriculum, exams.

3/ Modifications would include semi-automatic promotion from grade to grade, examination of noncognitive aptitudes including motor skills keyed to employment needs, and a financial scheme that increases the financial burden on upper income students and reduces it for the lower income.

4/ Giving responsibilities and resources to local management could strengthen the local elite and only worsen welfare opportunities. If the local elite is responsive and responsible to mass interests, then welfare could be improved.

That public education, complemented by private education under state supervision, has probably increased rather than decreased income inequality in most countries, is perhaps one of the major twentieth-century ironies of mass education. Equal access to educational opportunities in the rich countries have not yielded equal outcomes. In fact in most poor countries, equal access to even primary schools does not exist.

Reform. The reform of social institutions has never been an easy task. The institutions of mass education are no exception. Two theories of educational reform define the set of options that countries face. The first is the theory that educational structures and processes reflect social and economic forces. If this structuralist theory is correct, then it follows that economic and social changes have to precede major educational reforms. Under this theory potential reformers can only wait for the preconditions to be met and in the interval study and experiment with what are the most promising reforms.

The second theory, linked to the progressive theorists, does not make any assumptions about the interrelationship of the nature of formal education to other social forces. Rather it assumes that the education sector is capable of designing and implementing basic reforms without pressures from the society.

The history of educational reform, both in the rich and poor countries, provides more evidence for the structuralist theory. 1/ The evidence indicates that innovations, but not reforms, are possible under the progressive theory. The industrial revolution, installation of democratic governments, or the imposition of colonial rule brought major reforms to existing educational systems. In the post World War II era in the developing countries, educational reforms have usually taken place with the rise of new regimes having a greater commitment to alleviating poverty than previous ones - such has been the case in, for example, Peru, Cuba, China, and Tanzania.

With this discussion of reform, we end the section on major issues and options. Some readers will be disappointed that we have not discussed or recommended specific educational innovations or reforms. There are two reasons. First, we know virtually nothing about the cost effectiveness of seemingly attractive ideas that are now being proposed, like nonformal education or functional literacy. 2/ Second, the process of learning about their potential utility is an essential dimension to whether or not a country should consider adapting them and is the major responsibility of the country. Learning systems cannot be imported like bulldozers, and then be effectively used.

Because of the importance of educational reform for many countries, we devote the next section to exploring a strategy for approaching the issue.

1/ Katz (1968), Lawrence ( ).

2/ See Coombs (1974), Zymelman (1973), Simmons (1970/72).

IV. Toward Options for a National Strategy

Countries are confronted with two alternatives: either to continue as in the past, including the institution of minor changes, or to design and implement a package of reforms that reach well beyond the confines of the formal education sector to shape both the supply and demand for human resources. It should be clear from Section II that for most countries to follow the first alternative will mean even more serious misallocation than the present levels, and thus only postpones the day of reform. This section, therefore, concentrates on defining the strategy options within the second alternative.

A strategy outlines the crucial dimensions of a program to achieve a clear objective. Educational objectives in the past have tended to focus on increasing the quantity of school output, and to have assumed that the output would be efficiently used to achieve both growth and equity objectives. The educational strategies have been little more than programs for adding school places where the political pressures were the greatest.

But a strategy is not meant to be a comprehensive plan for action. Individuals in each country need to devise the comprehensive plans. Furthermore, this attempt by an employee of the World Bank to suggest options for a national strategy should not be seen as one more example of neocolonialism, but rather as an attempt to focus the discussion on the central issues.

Some readers will question the utility of suggesting strategy options that have meaning for more than one country when the educational structures and processes of countries seem so different from one another and the perceptions of the decision-makers so diverse. Does not each strategy need to be tailored to the situation? We have suggested in Section I that the differences may be more a question of degree rather than kind. The characteristics of social demand, educated unemployment, wage structures, examination systems and classroom organization are recognized as sharing common traits across countries.

Past educational strategies with objectives like increasing middle level manpower or universal primary schooling have been notable for their partial nature. While manpower analysis is an important dimension to educational planning, it was often relied on as the only tool. Little effort was made to understand the supply or demand for educated manpower in a full equilibrium framework. Linkages within the sector, substitution efforts, complementarities, and trade offs with other sectors were given little attention under a policy that "more schooling was better."

A review of educational policy across the developing countries suggests three broad categories: progressive, conservative, and transition. The two criteria for classification are: one, the extent to which education policy is diminishing the socially-regressive effects of the formal education, and two, the extent to which the educational policies are improving the internal efficiency of learning process both in and out of school. Per capita income level is not a useful criterion. The number of progressive countries is small,

including Yugoslavia, Cuba, Peru, Tanzania and China. Several countries may be considered in a state of transition to progressive policies because either their policies are not sufficiently comprehensive, or insufficient time has passed to determine if the policies are having the desired effect. These include Algeria, Sri Lanka, Eucador and chile. Even though other countries may spouse progressive educational objectives, insufficient evidence exists to determine if they are progressing towards these objectives.

Change is not an easy process. For this reason we concentrate in this section on the preconditions for serious educational reforms. Furthermore, some countries have already begun to design and implement important reforms and thus need to determine how many preconditions they have fulfilled. Thus a two-phase approach to developing a national strategy is suggested. The first phase is a phase of awareness and a transition from the present system, the second is a reorganization of learning. Each phase has several reference points or criteria which enable planners to determine how far along they already are in either phase. Combinations of these reference points can be used to construct a national strategy. The phases appear below in outline form; a discussion follows.

Phase I: Awareness and Transition

(a) The nature of the demand for skilled manpower;

(b) Over/under supply of skilled manpower;

(c) Effect of past educational investment on social equity; and

(d) Resources required for transition.

Phase II: Reorganization of Learning

(a) Motivation for reform;

(b) Information for reform;

(c) Technological and legal changes; and

(d) Resources for reform.

Underlying the scheme for the design of a new investment strategy are several assumptions. First, as we have discussed in the previous sections, present education systems seem to have much less an impact on learning than we had previously imagined. Second, the kinds of cognitive skills that are learned in school are much less important for lifetime earning and satisfaction than we had thought. Third, given present trends in the use of resources for formal education, an increasing number of countries face the immediate decision as to whether they should either regularly transfer resources from other sectors to meet the social demand for schooling, or strictly limit resources for schooling. The political pressures created by a decision to limit expansion, when combined with the inefficiencies and inequities of the present system, are encouraging some planners to seek alternatives to costly formal education.

The scheme below suggests one way to find the right questions to ask. This is only the first step in providing answers to the problems described in Section II and III. Discussion of the answers to the questions should be part of detailed investment planning, and belong to the people who will have the responsibility for preparation and implementation. It is a major theme of this paper that the problems are so serious with our ways of thinking about investing in education that our immediate efforts should concentrate on asking the right questions. In sum, the necessary and sufficient conditions tor completing Phase I are an analysis of: (a) demand for knowledgable manpower, (b) supply of manpower, (c) design for increased equity, and (d) resources for transition.

Phase I: Awareness and Transition

The road of educational reform is littered with rusting wrecks. The forces that can be allied against changes in the structure and processes of mass education are among the strongest in a society. It is for this reason that, as mentioned above, basic economic or political changes usually have to take place in society before fundamental educational reforms can occur. 1/ Hence, Phase I is the crucial first stage in determining whether or not a country is ready for the reforms implied in the options of Section III.

(a) Demand for knowledgeable manpower: The economic demand for manpower is generated by the creation of new jobs and replacement of workers leaving the work force. This is only one dimension of the social demand for school places which reflects both parental and employer requirements. Furthermore, the economic demand is for both experienced and inexperienced workers. Too often in the past it was assumed that new school leavers could satisfy the demand for experienced workers. The failure to specify job characteristics accurately is another reason for inaccurately specified manpower demands. What are these abilities? To what extent are they substitutable across occupations or within an industry? Is there a minimum threshold of competance that employers are seeking? To what extent do employers use the amount of schooling or the number of certificates a candidate has simply to limit the number of job applicants, with virtually no reference to the skills that the years of schooling may imply.

In most systems of technical education, there are no incentives for employers to participate in schooling decisions. 2/ An important first step in the transition to a system that is more effective would be to hold discussions about the characteristics/manpower demand among employers, students and teachers about these and other questions. Strange as it sounds, virtually no information flows between these three groups now, as they are not consulted by the educational planners about questions of the ability characteristics of jobs.

1/ Lawrence ( ), Katz (1968).

2/ For examples of some exceptions, see the tax supported in-plant training schemes in Latin America. See Cespedes ( ) and Zymelman (1970).

(b) Supply of skilled manpower: There are two basic supply side issues. The first is the extent to which worker characteristics required by occupations are enhanced by schooling. The second is the extent to which non-school experiences shape the desired traits more efficiently than schooling. For the first issue, are primary school graduates learning to read the national newspapers and then retaining this ability? Are they learning how to learn, and to enjoy it? Is rural education supplying useful abilities? Is the desired political socialization and modernization taking place, as it is assumed they are, or are the schools having a perverse effect? Is vocational education meeting the needs of workers, farmers, and managers?

For the second issue, the influence of non-school factors, there are several questions: (a) Can the desired skills be best learned through apprenticeships or on the job training? What abilities can be effectively developed in classroom situations?, and (b) Can skill training be more effective when it follows a period of work, rather than precedes work experience, assuming students may be more motivated and their objectives more clear? (c) Finally, to what extent is schooling important for promotion once in a job? How good an indicator of useful abilities are school examinations? Is there an over-supply or an under-supply of knowledgeable manpower for different jobs? Answers to these and similar questions will begin to describe the characteristics of the supply side.

(c) Design for increased equity: The major equity issue in the transition phase is to determine whether or not investment in schooling is having a positive or negative effect on the distribution of income. For the countries where we do not have data, the hypothesis is that schooling is having a negative effect on income distribution. A plan for at least neutralizing these effects should be designed during the transition phase.

(d) Resources for transition: To initiate and sustain discussion on the above three criteria requires two types of resources, leadership and expertise, for initiating, evaluating and managing change. Expertise without the leadership will not suffice. Leadership to provide the inspiration and management required both to raise the public's awareness of the issues and to use the expertise to propose solutions is required. Expertise means individuals, with or without formal training as education experts, who are willing to explore the above questions with an open mind, and then design and implement experiments with attractive solutions. The existence of research institutes or substantial funding, while offering advantages, are not preconditions for reform.

When the questions raised by the above four criteria have been studied and the level of awareness of the need for reform is established, and when a feeling of the urgency for reform has been established among both producers and consumers of formal education, then it is possible to consider moving to Phase II. 1/

1/ The planning and management of change has been subject to extensive research. For an example of valuable guidelines - see Douglas McGregor (1960).

Phase II: The Return to Learning

If the evidence presented in Section II is a fair analysis of both the determinants of learning and the contribution that schooling makes to learning, satisfaction and growth, then planners, producers and consumers of formal education need to revise their expectations about the returns to investment in schooling. More modest objectives need to be substituted for the old ones.

Two objectives may be reasonable replacements for the present objective of certification for its own sake. First, learning how to learn should be made much more explicit than it now is. For example, learning how to define and determine problems and establish optimal solutions should not be left for post-B.A. management training courses. 1/ Developing methods for the critical appraisal for other sources of information like radio, TV and word of mouth would be useful. Second, the process of learning should be more enjoyable than it often is if it is going to be actively and profitably used over a lifetime. The effect of schooling is often to damp the desire for learning in all but a few whose curiosities and motivation persists despite the effects of schooling. 2/

Successful achievement of these two objectives may in fact lead to more productive and less alienated individuals, but only a return to learning will provide the needed evidence.

(a) Motivation for reform: Individuals in almost every country are discussing innovations and reforms for their educational systems. Commissions are at work examining the strengths and weaknesses of the options. These discussions are important first steps in the transition phase to improved learning. But evidence of a deeper motivation for reform should come from the successful completion of Phase I. The supply and demand characteristics should have been carefully studied. Alternative designs to use investment in education either to neutralize or to enhance equity effects should have been prepared and debated. Progress on these dimensions would provide evidence for the existence of leadership and expertise. These achievements would indicate that sufficient motivation for reform existed to begin the planning and investment of Phase II.

1/ The importance of individual planning and problem definition has already been both demonstrated and replicated in subjects in the research of David McClelland (1969).

2/ "Thomas Edison Hated School" was the headline over the inventor's picture in a recent full page advertisement for correspondence courses in Time Magazine. Edison quit primary school after two years and spent a lifetime of self-taught learning.

(b) Information for innovation: Whether it is in agriculture, education or another sector, most countries seem to have to reinvent the wheel when they tackle their similar problems. The relatively rapid spread of the new wheat and rice varieties is the exception that proves the rule. Usually innovations diffuse slowly. Some potentially useful innovations have not been widely tried. They range from primary-level science curricula adopted for use by semiliterate teachers 1/ and farmer-oriented radio programs 2/ to short course paramedical training 3/ and ten-minute modules for teacher retraining. 4/ These innovations have not spread, in part, because they did not have the massive commitment, experimentation and organization that the new seed varieties enjoyed. Unless countries have access to ideas and innovations that have been successfully used elsewhere, they risk repeating years of experience gained elsewhere. Thus the potential reformers have to have easy access to the available information.

If we can assume that we have a fair understanding about how innovations are successfully communicated, then poor countries can reduce their dependence on short-term consultants or resident experts. Common sense is supported by the findings of innovation research that hearing a new idea is only one element in deciding to adopt the innovation. 5/ It has to be seen in action, thoroughly discussed, and experimented with on a small scale where there is virtually no risk in failing. But the experience of innovation in other countries is not enough. It has to be synthesized according to local needs, and then experiments designed to test the efficiency and effectiveness of the proposed innovations. The processes of experimentation serve two purposes basic to reform. The first is the test of the innovation and resulting adaptations. The second is the learning experience and resulting confidence that the experimenters develop. The innovation becomes theirs not only because they thoroughly understand it after the experiment, but also they have probably adapted it to local needs, thus giving them increased pride of development. An essential link in the successful spread of the new wheat and rice varieties was the training of local experts at Chapingo and Los Banos in order to participate in the testing of the innovations in their own countries. Only rarely can outside experts achieve the required effectiveness in either experimentation or widening ripples of confidence in the pool of skeptical potential users because they are outsiders.

1/ Duckworth (1971).

2/ For an analysis of the India Radio Farm Forum, see Roy et al (1969).

3/ Chinese Barefoot doctors and US Army paramedics.

4/ Secondary Teacher Training Methods, State of California.

5/ Rogers and Shoemacher (1971).

(c) Technological and legal change: Schools are a technology in the sense that they combined labor and capital to improve human capital. The evidence discussed in Sector II suggests that schools are not as efficient or effective a technology as we would like to believe. Thus, a major dimension of the return to learning will be the exploration of other learning technologies like the apprentice system, the integration of learning and working, and parent-child interaction.

But an equally important dimension of technological change is the scale and complexity of machinery that individuals will have to operate and repair. Economically appropriate technologies are increasingly being designed and built for the developing countries. One criterion for this redesign has been both the durability and repairability of the equipment, not engineered obsolescence. 1/ Unnecessarily sophisticated and fragile equipment in developing countries is usually not economically profitable for the owner or nation even if it is financially profitable for the importer or manufacturer. The successful experiments range from printing presses to water pumps and tractors. The use of appropriate technologies will have the effect of depending less on imported spare parts when the similar ones can be machined locally, and imported repairmen when several assemblies and disassemblies will make the handler an expert repairman. Vocational skill can become available to virtually anyone with curiosity, motivation and the basic psycho-motor skills, rather than to the domain of a few experts.

The law often supports mandatory formal education and gives the monopoly of formal education to the state. Private education is usually under state supervision, and exams for certificates are the same as in the state schools. When the effect of these laws is combined with the prevailing social sanctions to get as much formal schooling as possible, there are neither possibilities nor incentives for alternatives to formal education to develop.

The evolution of the position of education in Anglo-American law is enlightening. English common law had given parents virtually complete control over the education of the child. But by the beginning of the 20th century in the United States, "the education of youth (was said to be) a matter of such vital importance to the democratic state... that the state may go very far indeed by way of limiting the control of the parent over the education of his child." (Edwards, p. 24, 1955.) This statement should be contrasted with the United Nations Universal Declaration of Human Rights, adopted in 1948, that "parents have a prior right to choose the kind of education that should be given to their children" (Article 26-3). 2/ With the desire to improve learning, laws on mandatory schooling should be considered for revision.

1/ Until about 5 years ago, small boat fishermen in Central America had little trouble repairing their outboard motors. Then tolerances became finer, parts more fragile and the mechanisms more complex, thus making local repair impossible, lengthy or expensive.

2/ See Bakan (1971) for further discussion of the implications.

Employer hiring practices which screen applicants on the basis of formal education have assumed the status of de facto law. These practices make some sense when the skills taught in school are a major requirement for the job, like vocational education for bricklaying. But when only primary school certificate holders will be considered for jobs as sweepers and apprentice mechanics, while students with the same years of schooling but without the certificate are refused, then the hiring practices are both unfair and uneconomic. Some firms in developed countries no longer request information about schooling when interviewing candidates for certain blue and white collar jobs and prefer simple tests of the skills the job requires. Or, if the job skills cannot be adequately pretested, they allow a trial period during which it is expected that the candidate either demonstrate or learn the essentials of the skills on the job. Later experience will perfect the skills. Other firms have been forced by the courts to eliminate years of schooling as a requirement for hiring. The U.S. Supreme Court found that the use of years of schooling as a criterion for employment discriminated against low-income groups in economic advancement. The poor had not had an equal opportunity to gain as much schooling as other candidates. The Court found that jobs did not require most of the knowledge for which schools test students. 1/ Thus legal means may be required to change employer hiring practices.

(d) Political economy of reform: In Phase I we suggested the importance of expertise and leadership to provide information on alternative ways of education and to raise the awareness of consumers and producers of schooling about both the deficiencies of the formal system and the alternatives. As we suggested above, this information process is broadened in Phase II to include the results of experimentation with the alternatives. But there are two additional dimensions to the resources needed for reform; they are preconditions for successful completion of Phase II. First, basic changes in the sectors outside of education have to precede and thus induce changes in the educational processes and structure. Virtually no historical evidence exists to show that educational innovations have forced major changes in the economy. As long as large of artificial wage differentials continue to exist that are highly correlated with years of schooling, then the social demand for schooling will not decline. Second, considerable political courage and power is required to implement reforms of formal education which will reverse the unequal effect that schooling is now having on income distribution, and move toward more equal outcomes from the investment in schooling. Without this political precondition countries may decide that they do not wish to undertake either Phase I or II at this point in time. Even successful completion of Phase I will create significant political pressure to move to Phase II.

1/ The United States Supreme Court made such a decision in Griggs vs. Duke Power in March 1971 and subsequent lower court decisions have had important implications for removing the schooling requirement for hundreds of skilled jobs both craft and professional.

* * * * * *

Neither Phase I nor II have suggested that countries consider the immediate deschooling of their societies. Nor have they suggested that all poor countries should have similar learning objectives or mechanisms for improving the rate of learning. The purpose has been rather to suggest what are some crucial questions for exploring the basic issues.

The answers to these questions will yield the options for an educational strategy. Thus each country, and groups within it, can choose a strategy that both confronts the essential issues, and recognizes the unique conditions of the country.

A Best Guess. The preceding discussion was intended to explore issues. We cannot suggest a blueprint for educational reform because each country and groups within the country have to develop the education program which they want. While many are aware of the inadequacies of the present systems, little hard evidence exists about possible options. This is the major dilemma of parents and planners. Little was known about the effectiveness or cost benefit nature of most social investments before they were launched nationally, ranging from health insurance to teacher training and family allowances for children in both developed and developing countries. It is not surprising that in retrospect they may appear ridiculous. We know more about the cost effectiveness of alternative production techniques of motor boats than we do of teaching reading or delivering prenatal care. Now is the time to begin to design and test educational options for achieving our objectives of improving economic growth, educational efficiency and social equity. While some countries may be able to design and implement options without basic changes in their structure of production and consumption of their economies, others will not.

The economic guidelines for improving educational investments can be considered as an approach to three problems discussed in section III. They are as follows:

A. To damp the social demand:

(1) Ensure that artificial wage differentials for different occupations be rapidly narrowed. International trade in human capital also requires better controls to limit the export of highly-skilled manpower from poor countries. Artifical distortions in factor and product prices should be reduced to encourage use of labor intensive technologies;

(2) Ensure that certificates of schooling are no longer required for most occupations. When employers become more skill specific in their needs, a flexible education structure will emerge to meet the better specified demand;

(3) Require that middle- and upper-income students share a greater burden of the costs of their secondary and higher education. Explore the advantages of establishing an educational bank to transfer to the consumer the responsibility for both repayment and purchase of educational services. Time spent in public service would count as a form repayment, and should be encouraged. Localize school taxation and expenditure so that the costs and benefits are better understood locally. Low-income groups should have sufficient subsidies to permit them to overcome the private costs of schooling; and

(4) In countries with an over supply of school leavers, introduce a system of quotas whereby the absolute number of students in the formal system at the secondary and higher levels is restricted to the rate of population increase or even less. It can be combined with existing exam systems. In some countries, rationing is already taking place on a basis of geographic location, which serves as a proxy for parental social status. It should be made explicit and fair. Finally, this should encourage the share of the national budgets and GNP going for schooling to fall for many countries and level off for others. Misallocation will be reduced.

B. Increasing the economic relevance of learning alternatives is more difficult than it may seem. Some countries like Cuba and China have made more sustained and comprehensive efforts than others. 1/ Rich countries have also made considerable efforts to improve learning among low-income groups. 2/ Some countries are considering nonformal education as a panacea for the illnesses supposedly caused by formal education, but we know virtually nothing about either how effective or how costly this is. 3/ To improve the opportunity for the development of alternative learning systems:

1/ For Cuba, see Hahlman (1973), Bowles (1971).

2/ For the United States, see Beller (1968(, Devenberg (1970), Gordon (1957).

3/ Coombs (1973).

(1) Eliminate the monopoly power of governments in the field of organized learning. If creative and economic alternatives to formal schooling are to develop, then incentives should be established to encourage more productive learning technologies. Experience is increasing with voucher systems where the parents pay the teachers. 1/ Apprentice systems may be the most efficient for other skills;

(2) Increase the effectiveness with which the basic cognitive skills are learned, and thus reduce the phenomenon of primary schools producing semiliterates; and

(3) Explore the opportunities of informal education, using adults and more advanced students to teach.

C. Compensate for the inequality effects of most of the existing formal school systems:

(1) Establish quotas on the basis of social class, geographic location or school, to assure that the proportion of the low income students at secondary and higher levels is equal to or higher than their representation in the population;

(2) Consider the use of automatic promotion from one grade to the next;

(3) De-emphasize the role of examinations for promotion. Eliminate the social class bias to present examinations. 2/ Add the testing for wider range of behavioral skills; and

(4) Develop mechanisms to encourage students who dropped out to re-enter the formal system at an older age.

These suggestions are a best guess as to possible guidelines. They are nothing more than a starting point for discussion among the producers and consumers of formal education to improve efficiency and equity.

Conclusion

We have not suggested what proportion of the GNP to invest in education because the analytic techniques are not sufficiently developed. We have examined the nature of the educational production process and found that a range of nonschool inputs are usually stronger determinants of learning and behavior than the school inputs. School inputs are often insignificant beyond undefined threshold levels. Economic efficiency seems low, particularly at the secondary and higher level. We have also examined the effect of education

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1/ Freeman (1973), Jencks (1971).

2/ See for example, ILO Kenya (1973), p. 523.

on employment and income distribution. The evidence suggests that the employment effects are much less than estimated by early research, indicating that other investments may be more socially profitable than education. The income distribution effects are probably perverse in most countries. A review of the major features and issues has suggested that the contribution of education to growth and development has been less than we would have expected.

To increase the value of human capital with optimal use of resources will require significantly different approaches than are now being used in most poor countries. The evidence increasingly shows that the early factors which determine cognitive and noncognitive traits need increased understanding and investment. The traits required by occupation as well as leisure need to be more systematically considered than they have in the past. The question 'learning for what' is essential for both individuals and societies. What is called for is an integrated strategy for investment in human capital that considers the potential contribution of all human capital inputs. Such a strategy would assist in reducing past inefficiencies and inequities and increasing the returns to scarce resources.

Table 1: INDEX OF ENROLLMENTS (1960 = 100)

Primary, Secondary, and Higher Education

AFRICA

YEAR	KENYA			MADAGASCAR			NIGER			SENEGAL			TUNISIA			UGANDA		
	P	S	H	P	S	H	P	S	H	P	S	H	P	S	H	P	S	I
1955	55	49	62	64	60	57	38	28[c]	-	48	56	36	52	70	85	67	60	62
1960	100	100	100	100	100	100	100	100[c]	-	100	100	100	100	100	100	100	100	100
1965	133	217	877	149	208	278	233	252	-	170	278	198	163	168	231	99	185[d]	135
1966									-	179	311	239				119	64[d]	
1967	145	399	1,295	165	233	340	290	321	-	193	391		184	224	264	120	109	204
1968	155	454	1,461	181	319	321	308	366	-	199			191	249	301	119		239
1969	164	538		196			316	461	-				200			133	114	
1970	183	603 (d)							-				206					

ASIA

YEAR	AFGHANISTAN			INDIA			POWER			THAILAND		
	P	S	H	P	S	H	P	S	H	P	S	H
1955	61	16[d]	45	68	63	68	81	104	80	75	109	69
1960	100	100	100	100	100	100	100	100	100	100	100	100
1965	204	239	203	153	169	163	137	117	143	117	122	86
1966							143	154		121	127	
1967			255				149	168	173	125	140	84
1968	269	418	309				153	186	175	130	154	86
1969	285	493					155	208				
1970	308	605					159					

LATIN AMERICA

YEAR	BRAZIL			GUATEMALA			COLOMBIA			PERU			VENEZUELA		
	P	S	H	P	S	H	P	S	H	P	S	H	P	S	H
1955	65	56	76	71	75	62	73	56	59	75	57	54	53	36	29
1960	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1965	133	159	163	136	180	147	135	169	192	139	195	208	119	164	175
1966							143	202	220			239			
1967	150	206	225	154	201	180	153	233	258	155	258	297	127	198	222
1968	160	236	225	166	211	228	162	244		162	284		131	214	252
1969	165	267		165	222								136	248	
1970															

(d)

Notes: b: including junior secondary classes.
c: not including vocational education
d: not including teacher training.

Source: UNESCO Statistical Yearbook
1970: Tables 2.7, 2.9, 2.12
1971: Tables 2.11, 2.12, 2.15.

Table 2: ENROLLMENT RATIOS

Percentage Enrolled of Corresponding Population of School Age*
Primary, Secondary and Higher Education

AFRICA

Year	KENYA			MADAGASCAR			NIGER			SENEGAL			TUNISIA			UGANDA		
	P	S	H	P	S	H	P	S	H	P	S	H	P	S	H	P	S	H
1955	32	1		37	3		2	0.1c	-	14	2		47	9		36	4	
1960	49	2	0.04	52	4	0.10	6	0.3c	-	27	3	0.50	74	11	0.88	51	5	0.15
1965	55	4	0.36	70	7	0.28	12	0.6	-	40	7	0.90	102	18	1.78	44	9	0.18
1966	55	5					13	0.8	-	42	8		106	18		52b	3c	
1967	60	7		71	8		14	0.8	-				106	19	2.09	51b	5c	
1968	60	8	0.67	77	10	0.43	14	0.9	-	44		0.90	107	20				
1969									-							54	4	

ASIA

Year	AFGHANISTAN			INDIA			KOREA			THAILAND		
	P	S	H	P	S	H	P	S	H	P	S	H
1955	6	1		34	7		89	29		79		
1960	10	1	0.13	42	10	1.69	96	27	4.70		12	1.92
1965	16	2	0.25	55	15	2.65	100	34	6.18	80	12	1.64
1966	17	3					102	34		80	12	
1967	19	3					104	34		80	13	
1968	20	4					105	36		81	13	1.55
1969	20	5	0.38				104	38	7.19			

LATIN AMERICA

Year	BRAZIL			GUATEMALA			COLOMBIA			PERU			VENEZUELA		
	P	S	H	P	S	H	P	S	H	P	S	H	P	S	H
1955	76	8		43	5		69	7		77	11		67	10	
1960	100	11	1.58	49	6	1.68	77	10	1.76	88	18	3.62	100	23	4.00
1965	115	18	2.20	55	9	2.16	88	17	2.94	102	29	8.04	95	30	6.33
1966	120	19		57	9		90	20		106	32		96	31	
1967	123	20		58	10		93	22		109	36		95	33	
1968	128	23		61	9		95	21	4.98	101	38	10.60	96	34	
1969	128	25	4.36	59	9	3.40							98	38	8.82

Notes: * Higher Education School Age Taken to be 20- 24 years.

Source: UNESCO Statistical Yearbook 1970 Table 2.5, 1971 Table 2.7.

Annex Table 3

AVERAGE ANNUAL RATES OF GROWTH OF ENROLMENTS[1] AND ENROLLMENT RATIOS

(1955 to end of data series in Tables 1 and 2 - percent)
Primary, Secondary and Higher Education

AFRICA

Education Level	KENYA (1)	KENYA (2)	MADAGASCAR (1)	MADAGASCAR (2)	NIGER (1)	NIGER (2)	SENEGAL (1)	SENEGAL (2)	TUNISIA (1)	TUNISIA (2)	UGANDA	
P	8.28	4.95	8.31	5.79	16.33	16.14	11.49	9.21	9.35	6.53	5.07	2.94
S	18.25	17.34	19.98	9.70	22.33	18.41	17.69	13.43	10.23	6.33	4.71	0.[illegible]
H	27.55	42.23	14.25	20.00	-	-	18.90	7.62	10.18	11.42	10.99	3.[illegible]

ASIA

Education Level	AFGHANISTAN (1)	AFGHANISTAN (2)	INDIA (1)	INDIA (2)	KOREA (1)	KOREA (2)	THAILAND (1)	THAILAND (2)
P	11.09	8.98	8.61	5.12	4.55	1.12	4.28	0.19
S	18.70	12.18	10.28	7.92	5.06	1.95	2.69	1.00
H	16.04	12.66	9.17	9.41	6.22	4.84	1.65	-2.64

LATIN AMERICA

Education Level	BRAZIL		GUATEMALA		COLOMBIA		PERU		VENEZUELA	
P	6.83	3.79	6.09	2.29	6.29	2.49	6.15	2.11	6.66	2.75
S	11.85	8.48	8.78	4.29	13.09	8.82	13.32	10.01	14.85	10.01
H	11.02	11.94	10.54	8.15	13.14	13.82	14.30	12.37	18.11	9.18

Note: Higher education begun with 1960.
Sources: Tables 1 and 2.

Annex Table 4

Public expenditure on education as % of GNP
1960 and 1965-1968 (unweighted averages)

	No. of countries covered	1960	1965	1966	1967	1968
World	(85)	3.02	3.75	3.83	4.08	4.24
Developed countries	(31)	3.52	4.45	4.55	4.73	4.80
Developing countries	(54)	2.73	3.35	3.42	3.72	3.91

Source: Goldstone, p23

Annex Table 5

- Public expenditure on education, 1960 and 1965-1968 (millions US dollars - in current prices) (revised)

Major regions	1960	1965	1966	1967	1968
WORLD TOTAL 1)	54 350	96 360	106 980	119 090	131 640
AFRICA	1 110	1 660	1 920	2 170	2 370
NORTHERN AMERICA	22 670	39 740	44 050	49 940	56 510
LATIN AMERICA	1 880	3 230	3 670	4 000	4 430
ASIA 1)	3 710	7 380	8 370	9 470	10 660
EUROPE AND USSR	24 380	43 280	47 660	52 110	56 220
OCEANIA	600	1 070	1 310	1 400	1 450
(ARAB STATES)	(700)	(1 020)	(1 100)	(1 210)	(1 310)
DEVELOPED COUNTRIES	49 450	88 190	97 820	108 670	120 290
DEVELOPING COUNTRIES	4 900	8 170	9 160	10 420	11 350

1) Not including China (mainland), Democratic People's Republic of Korea, and Democratic Republic of Viet-Nam.

2) When national currencies are converted is to the US dollar the inflation effects in the other currencies are minimized.

Source; Goldstone, p25

Annex Table 6

AVERAGE WAGES BY SECTOR FOR SELECTED COUNTRIES

INDEXED TO LOWEST SECTOR WAGE IN COUNTRY (=100)

SECTORS BRANCHES IN MANUFACTURE	AGRI-CULTURE	MANU-FACTURE	FOOD PRO.	TOBACCO	CHEMICALS	FURNITURE	TRANSPORT EQUIPMENT	MINING	CONST-RUCTION	TRANS-PORTATION	ALL NON AGR.
Africa											
Ghana	100	231	127	455	257	131	254	225	114	261	226
Kenya	100	244	216	542	237	100	220	279	285	661	-
Tanzania	100	208	-	-	-	-	-	219	171	262	223
Latin America											
Colombia	100*	155	132	126	137	121	150	253	-	-	-
Guatemala	-	138	113	234	116	100	164	-	-	-	-
Peru	-	-	132	202	113	100	150	-	261	252	238
Venezuela		140	115	140	160	100	225	264	-	-	-
Asia											
India	100*	402	-	-	425	316	460	100	-	-	-
Korea (ROK)	100*	137	112	-	159	126	141	148	-	-	150
Philippines	-	173	132	104	167	100	119	173	-	162	191
Europe											
Austria	100	208	164	164	-	-	-	-	-	-	157

* Estimated by multiplying daily rate by 200 working days.

Annex Table 7: FRENCH ACHIEVEMENT: PERCENTAGE CORRECT RESPONSES BY GRADE

Grade	Total Correct Responses						Mean Correct	Standard Deviation Correct
	0	1	2	3	4	5		
4th Primary	64	18	18	0	0	0	.55	.78
5th Primary	14	38	20	23	4	1	1.69	1.17
6th Primary	4	12	26	31	22	5	2.70	1.19
2nd Secondary	0	2	6	31	40	21	3.71	0.93

ARABIC ACHIEVEMENT: PERCENTAGE CORRECT RESPONSES BY GRADE

Grade	Total Correct Responses						Mean Correct	Standard Deviation Correct
	0	1	2	3	4	5		
4th Primary	42	30	15	12	0	0	.97	1.03
5th Primary	7	20	21	42	10	0	2.28	1.10
6th Primary	4	8	15	36	27	11	3.08	1.22
2nd Secondary	0	0	3	19	35	41	4.12	0.89

ARITHMETIC ACHIEVEMENT: PERCENTAGE CORRECT RESPONSES BY GRADE

Grade	Total Correct Responses				Mean Correct	Standard Deviation Correct
	0	1	2	3		
4th Primary	48	45	6	0	.57	.60
5th Primary	10	32	56	1	1.49	.69
6th Primary	3	14	60	23	2.02	.70
2nd Secondary	1	5	42	51	2.44	.65

N.B.: Uncorrected for guessing.

Source: Simmons, 1973.

Annex Table 8

PUBLIC EXPENDITURES PER STUDENT

1. Uganda (Shillings, 1963)	Current	Capital	Total	Index
Primary	170	300	470	100
Secondary	2,710	11,000	13,710	2,917
Technical	20,000	11,000	31,600	6,595
University	22,500	35,000	57,560	12,234

Source: Coombs and Hallack, p.21 (1sh = $)

2. Tunisia (Dinars, 1971)	Current	Capital	Total	Index
Primary	23	1	24	100
Secondary	156	25	181	754
Technical (Indust.)	202	6	208	867
Technical (Agri.)	416	-	416	1,733
University	762	224	986	4,108

Source: IBRD Tunisia, 1973 I dinar = $1.20

3. United States (Dollars, 1969)	Current	Capital	Total	Index
Primary			747	100
Secondary			747	100
University			1,490	199

Source: US Office of Education, Digest of Educational Statistics, (Washington, D.C., US Government Printing Office, 1969).

Annex Table 9

Expenditures PER GRADUATE IN 1971
(current prices in dinars)

	D / Student (1)	Mean years required to obtain certificate (2)	D / Graduate (3)	Number of non-certificate students per certificate holder (4)	Mean years schooling non-certificate students (5)	Total Cost of non-certificate Students (1)x(4)x(5) (6)	D / Graduate (3)+(6) (7)
1. EACH LEVEL							
Primary	24	8	192	2.1	4	202	394
Secondary	181	9	1,629	5.2	3	2,769	4,398
Vocational (Indus.)	208	4	832	2.7	2	1,123	1,955
Vocational (Agric.)	416	7	2,912	3.0	3	3,744	6,656
Higher	986	6	5,916	3.0	3	8,874	14,790
2. CUMULATIVE							
Primary + Secondary			1,829				4,792
Primary + Voc. (Ag.)			3,104				7,050
Primary + Sec. + Higher			7,745				19,582

Source: IBRD, Tunisia, 1973

Annex Table 10

COMPARISON OF INCOME DISTRIBUTION IN BRAZIL
IN 1960 AND 1970 SHOWING AGE, SEX AND EDUCATION

		SHARE OF LABOR FORCE			% OF INCOME			AVERAGE INCOME (NCr/Mth 1970)			GINI		
		1960	1970	% Change	1960	1970	% Change	1960	1970	% Change	1960	1970	% Change
Sex	M	83.22	79.52	- 4.45	89.12	86.51	- 2.93	221	306	+38.46	.4902	.5672	+15.71
	F	16.78	20.48	+22.05	10.94	13.49	+23.31	130	186	+38.81	.5269	.5441	+ 3.26
Education													
	A	39.05	29.75	-23.81	21.12	11.79	-44.18	111	112	-	.4162	.3886	- 6.63
	P	51.71	54.47	+ 5.34	53.17	46.46	-12.62	211	240	+13.74	.4183	.4614	+10.30
	G	5.16	8.03	+55.62	11.06	13.74	+24.23	440	482	+ 9.54	.4307	.5134	+17.03
	C	2.67	5.24	+96.25	6.97	12.79	+83.50	536	688	+28.36	.4247	.5007	+17.89
	S	1.40	2.51	+79.28	7.66	15.21	+98.56	1.123	1.706	+51.91	.4590	.4596	+ 1.31
Age	10/14	1.98	2.37	+19.70	0.50	0.49	- 2.00	52	58	+11.53	-	-	-
	15/19	10.47	11.88	+13.47	5.10	4.59	-10.00	101	109	+ 7.92	.4271*	.4085*	- 4.35*
	20/24	14.89	15.81	+ 6.18	11.71	11.12	- 5.04	162	198	+22.22	.4105	.4340	+ 5.72
	25/29	14.21	13.71	- 3.52	14.26	13.57	- 4.84	207	279	+34.78	.4427	.5083	+14.82
	30/39	24.22	23.03	- 4.91	28.48	27.90	- 2.04	243	341	+40.33	.4839	.5511	+13.89
	40/49	17.36	17.18	- 1.04	21.06	23.49	+11.54	251	385	+53.39	.5142	.5888	+14.51
	50/59	10.29	10.05	- 2.33	12.40	12.66	+ 2.10	249	355	+42.57	.5367	.6140	+14.40
	60/69	4.92	4.49	- 8.74	5.18	4.98	- 3.86	217	312	+43.78	.5580	.6409	+14.85
	70 & above	1.66	1.30	-21.69	1.39	1.06	-23.74	173	228	+31.79	.5487	.6265	+14.18
Totals								206	282	+36.89	.4999	.5684	+13.70

Notes: Education - A - Illiterates; P - Primary; G - Secondary; C - College; S - Higher.
(*) Refers to the group 10 - 19.
Source: Langoni, Table 4.14, cited by I. M. Hume, "Notes on the Distribution of Income in Brazil," IBRD, 1972.

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